

# KIC 003247616

## Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	$R_{\star}$ ( $R_{\odot}$ )	$T_{\star}$ (K)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003247616-01	OBS	No	3.471928	132.100191	70.7	9.800	12.2	14.5	3.13	6915	4.99	7123.95
003247616-02	OBS	No	3.472358	134.876085	0.0	6.691	10.0	0.0	3.13	6915	0.01	7122.77
003247616-03	OBS	No	3.471931	134.373317	32.8	8.764	8.9	9.3	3.13	6915	2.22	7123.94
003247616-04	OBS	No	289.107157	379.348536	246.4	21.063	11.6	7.5	3.13	6915	5.82	19.59
003247616-05	OBS	No	126.523774	180.521913	349.7	3.437	8.5	9.1	3.13	6915	6.71	58.96
003247616-06	OBS	No	81.171074	206.811883	195.3	4.351	7.5	7.3	3.13	6915	4.94	106.56
003247616-07	OBS	No	148.796891	198.768348	291.8	4.044	7.3	7.9	3.13	6915	7.04	47.50

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003247616-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV
003247616-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—SWEET_NTL—LPP_DV—SAME_NTL_PERIOD—CENT_FEW_DIFFS
003247616-03	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—SAME_NTL_PERIOD
003247616-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
003247616-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT
003247616-06	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
003247616-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

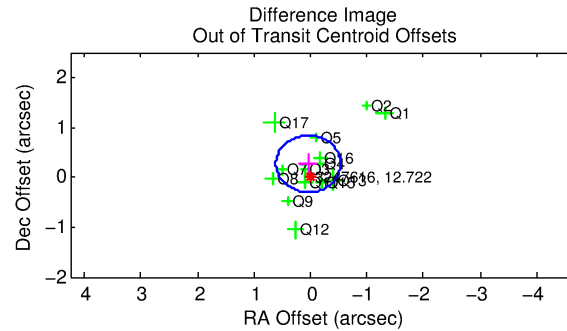
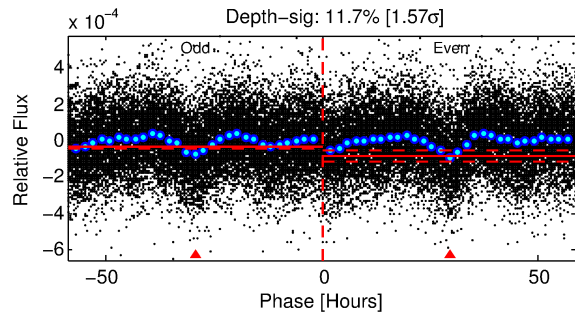
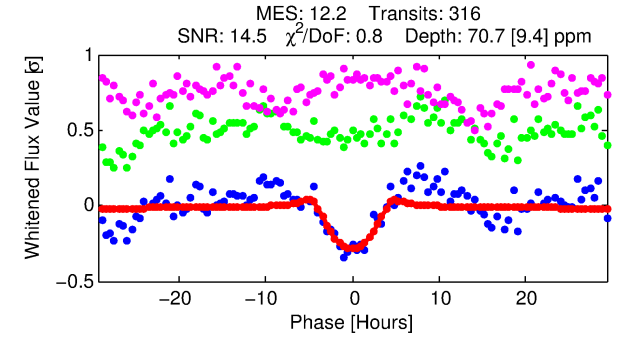
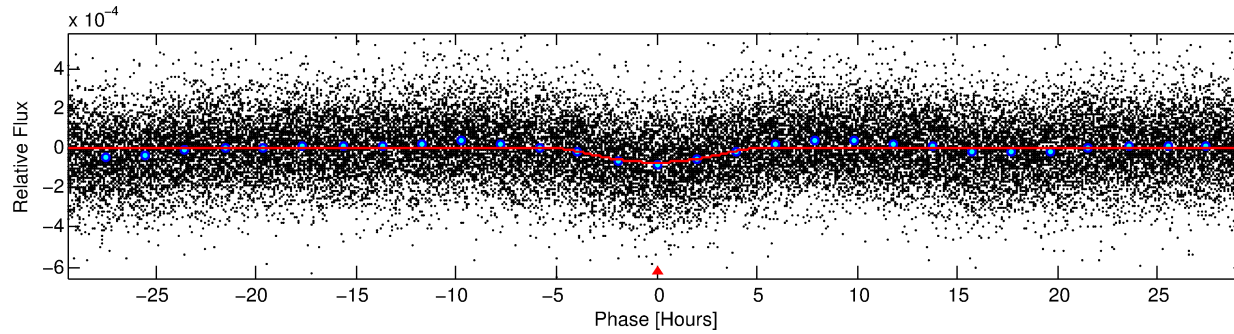
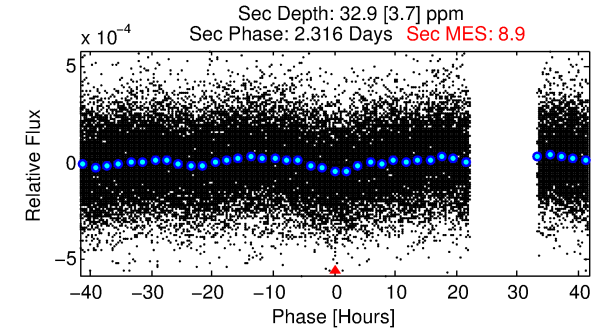
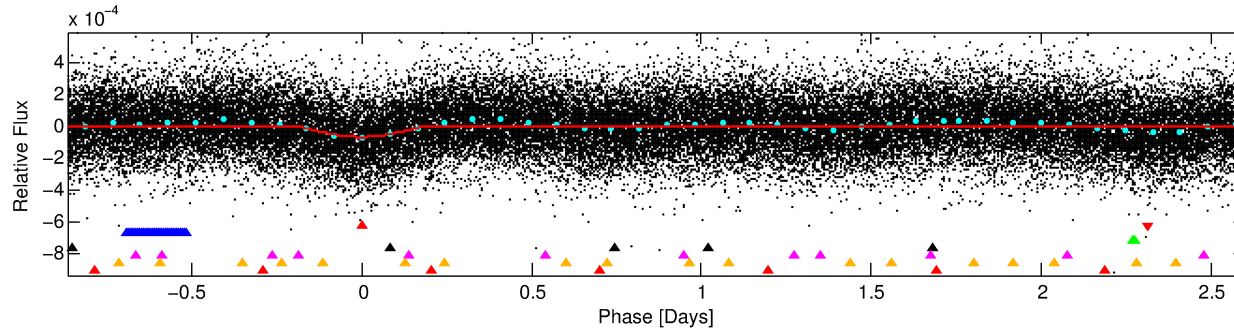
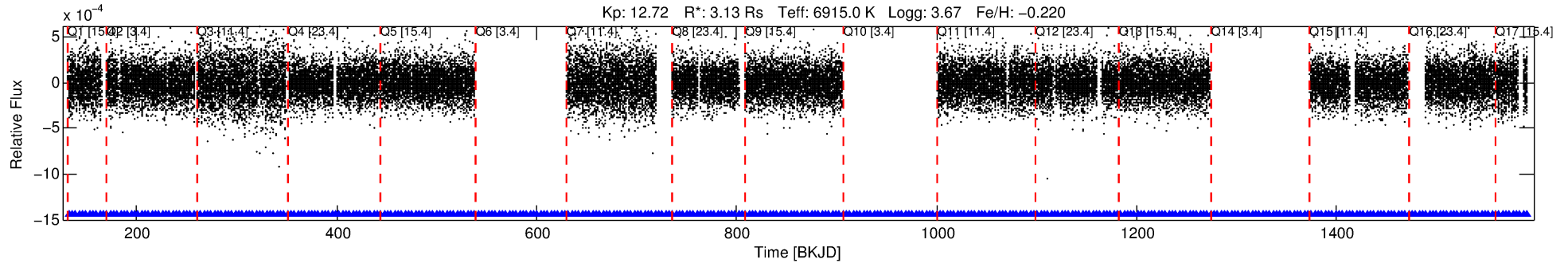
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 003247616-01

No Significant Match Found

# DV One-Page Summary

KIC: 3247616 Candidate: 1 of 7 Period: 3.472 d



## DV Fit Results:

Period = 3.47193 [0.00005] d  
Epoch = 132.1002 [0.0124] BKJD  
Rp/R\* = 0.0146 [0.0172]  
a/R\* = 1.12 [0.05]  
b = 1.00 [0.03]  
Seff = 7123.95 [3937.31]  
Teq = 2343 [324] K  
Rp = 4.99 [6.12] Re  
a = 0.0530 [0.0178] AU  
Ag = 2.04 [4.93] [0.21σ]  
Teffp = 4330 [2552] K [0.77σ]

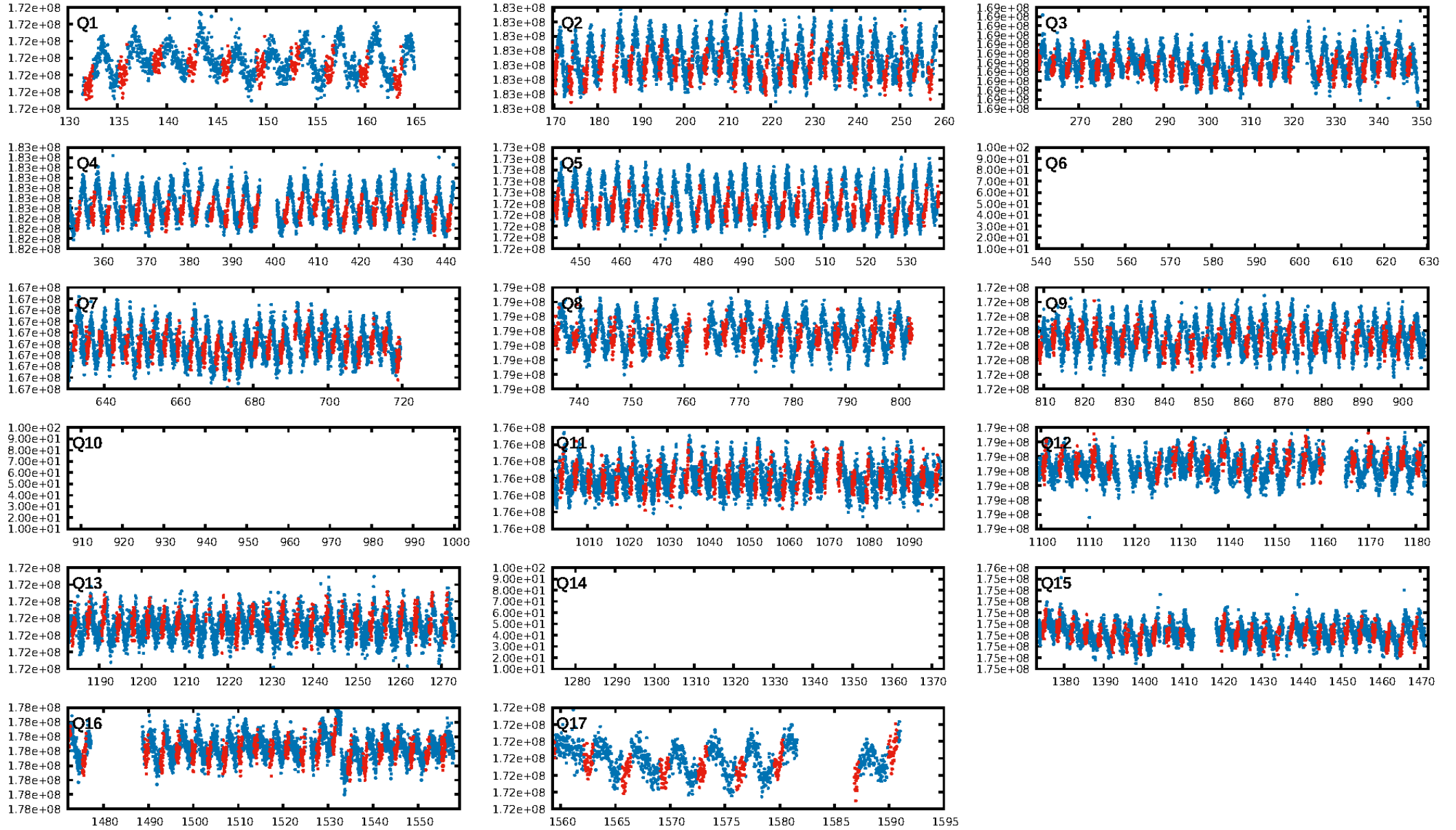
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 3.26e-20  
RollingBand-fgt: 1.00 [297/297]  
GhostDiagnostic-chr: 1.942  
Centroid-sig: 0.0%  
Centroid-so: 0.890 arcsec [1.89σ]  
OotOffset-rm: 0.271 arcsec [1.43σ]  
KicOffset-rm: 0.384 arcsec [2.02σ]  
OotOffset-st: 1/4/4/5 [14]  
KicOffset-st: 1/4/4/5 [14]  
DiffImageQuality-fgm: 1.00 [14/14]  
DiffImageOverlap-fno: 0.00 [0/14]

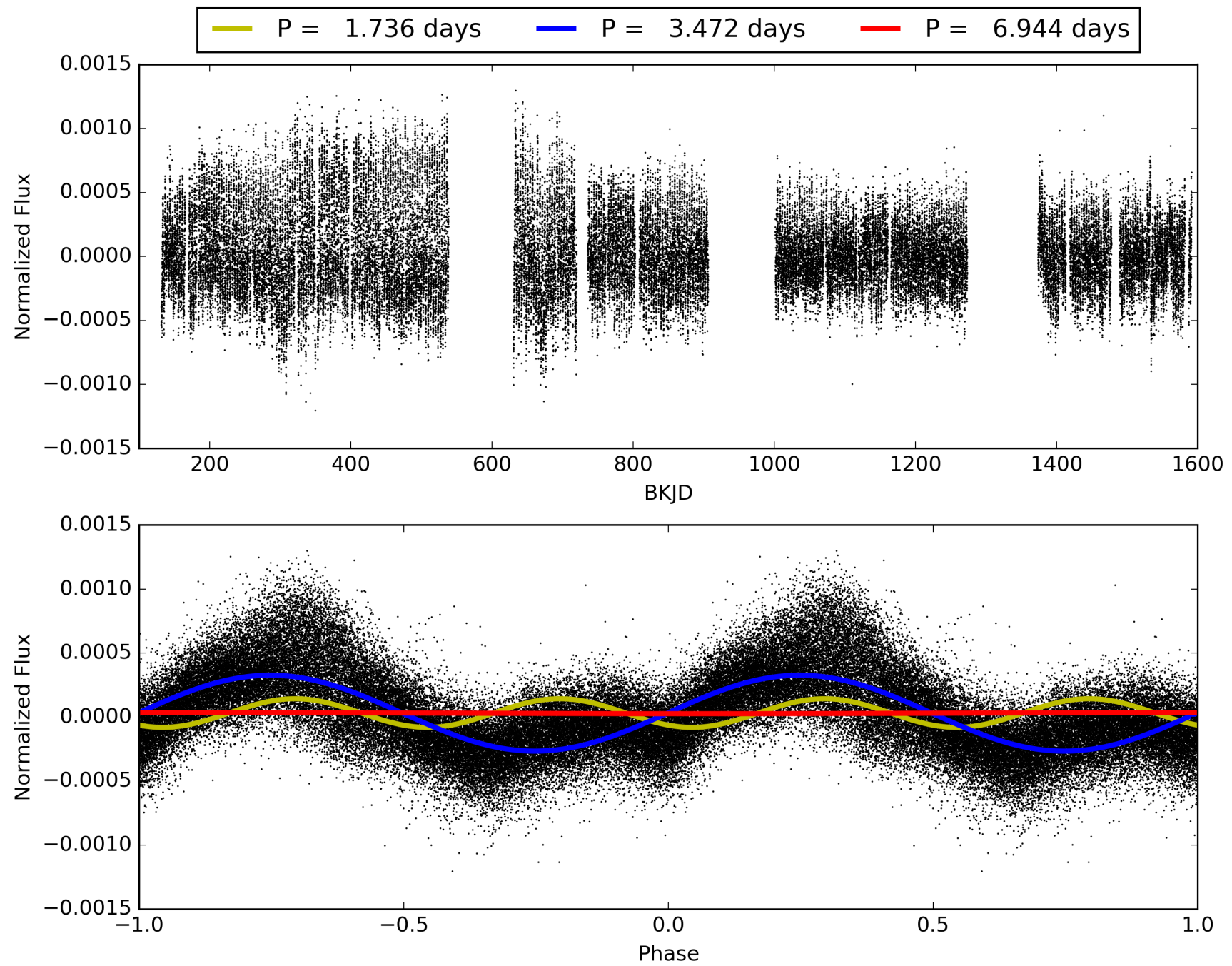
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 13:09:53 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 003247616-01, PDC Light Curves



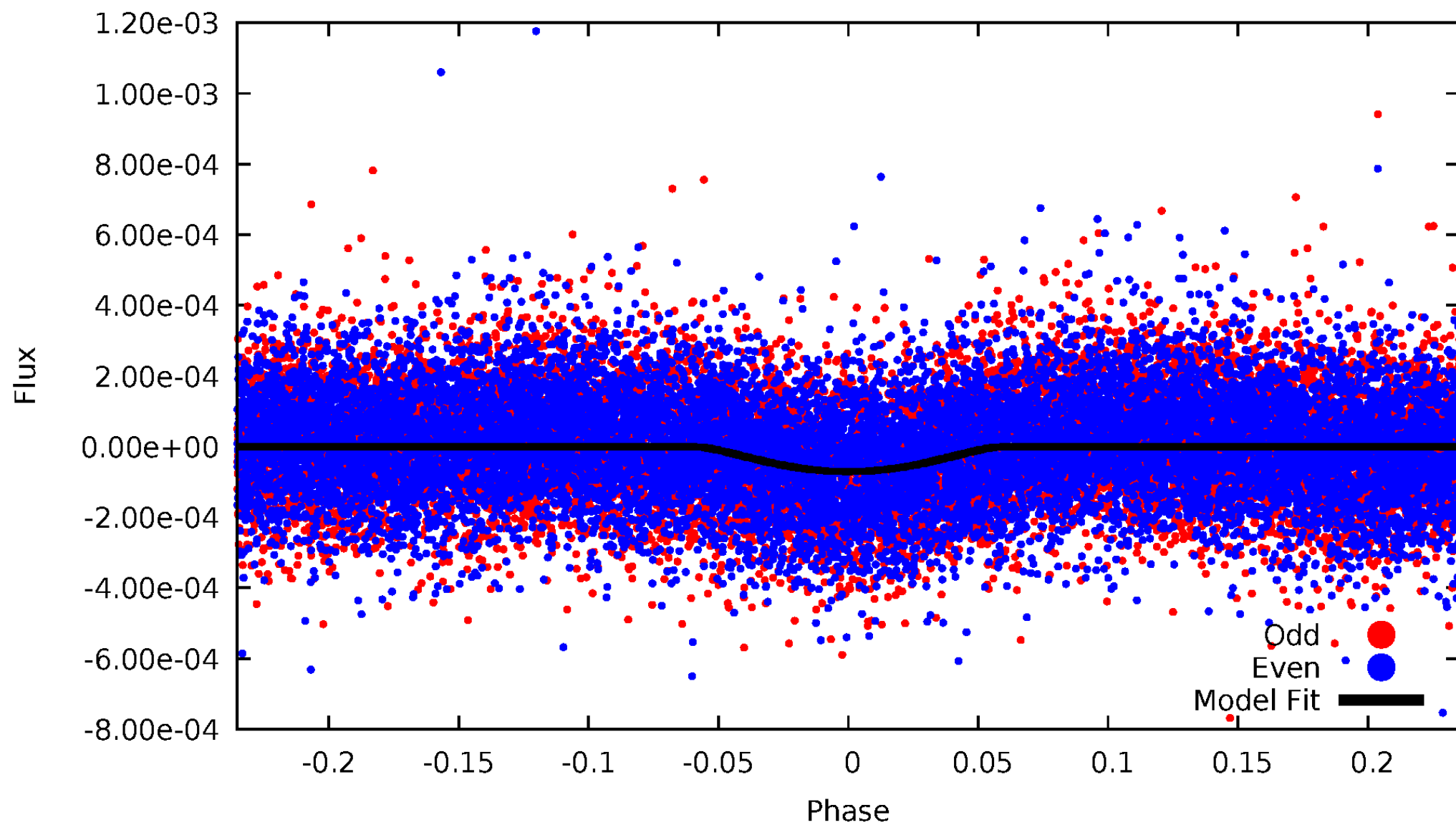
TCE 003247616-01





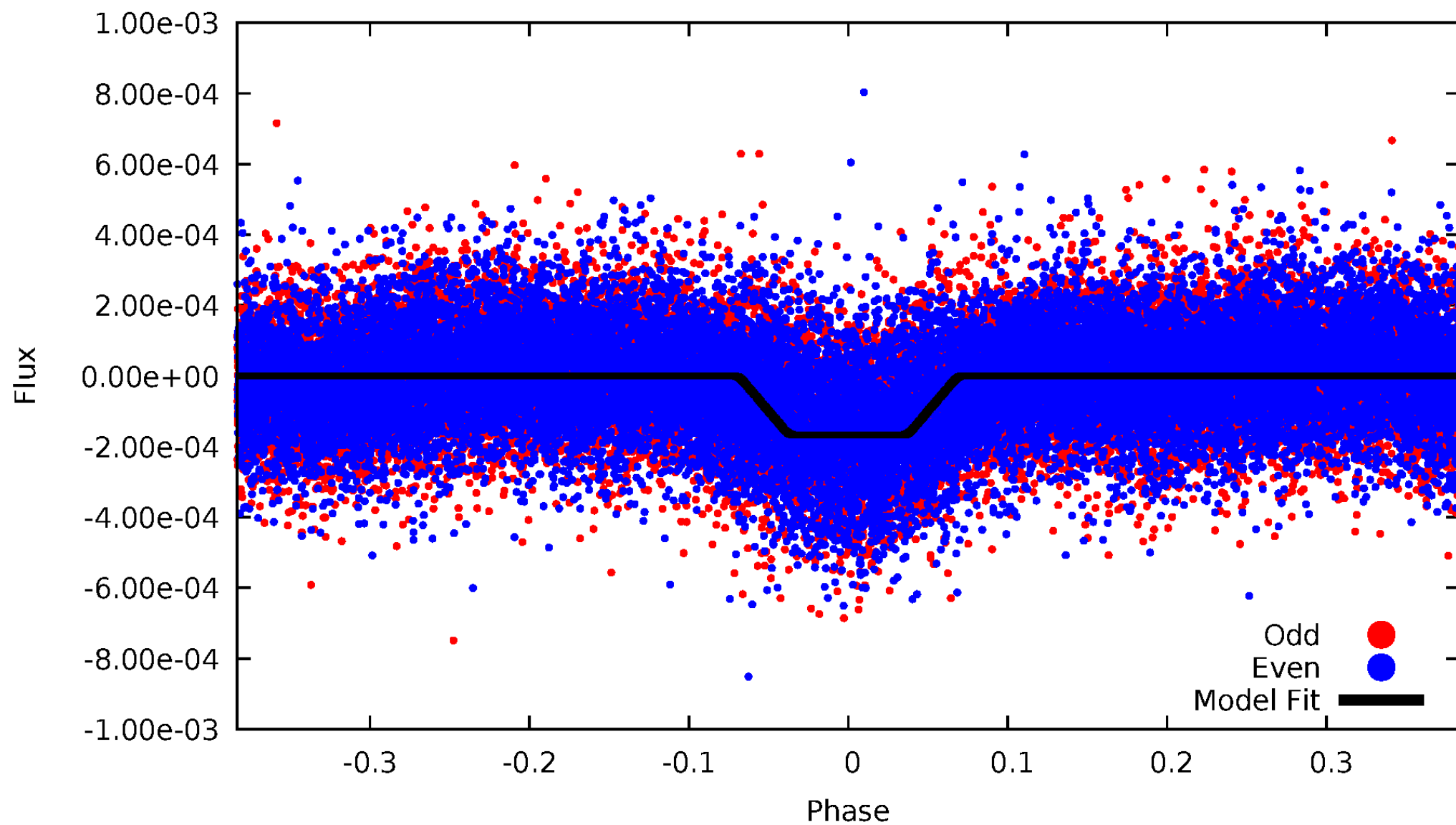
# DV Odd/Even

TCE 003247616-01



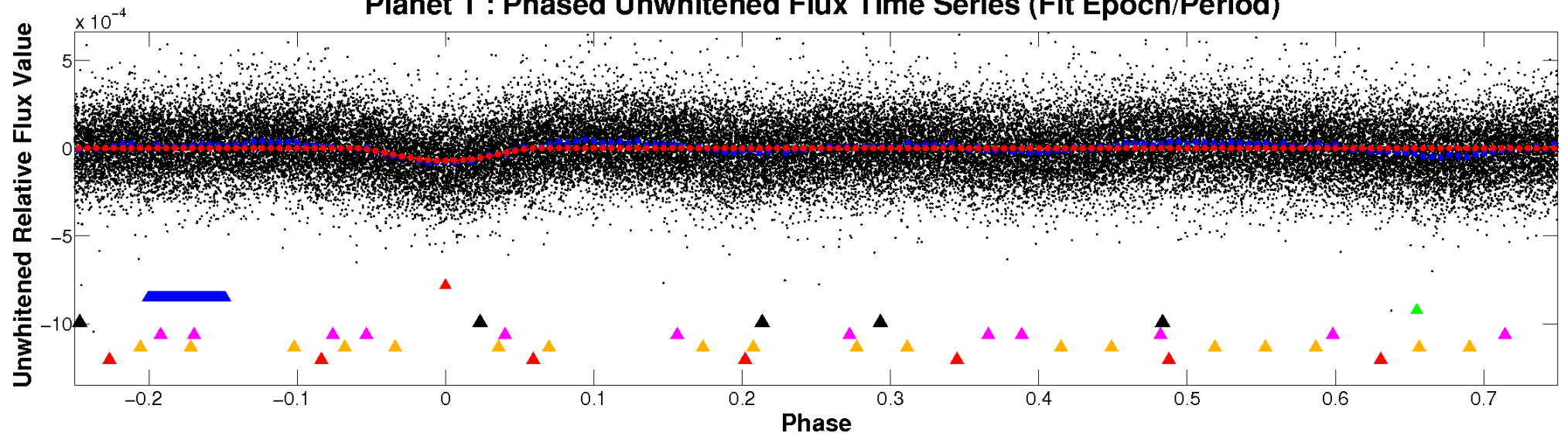
# ALT Odd/Even

TCE 003247616-01

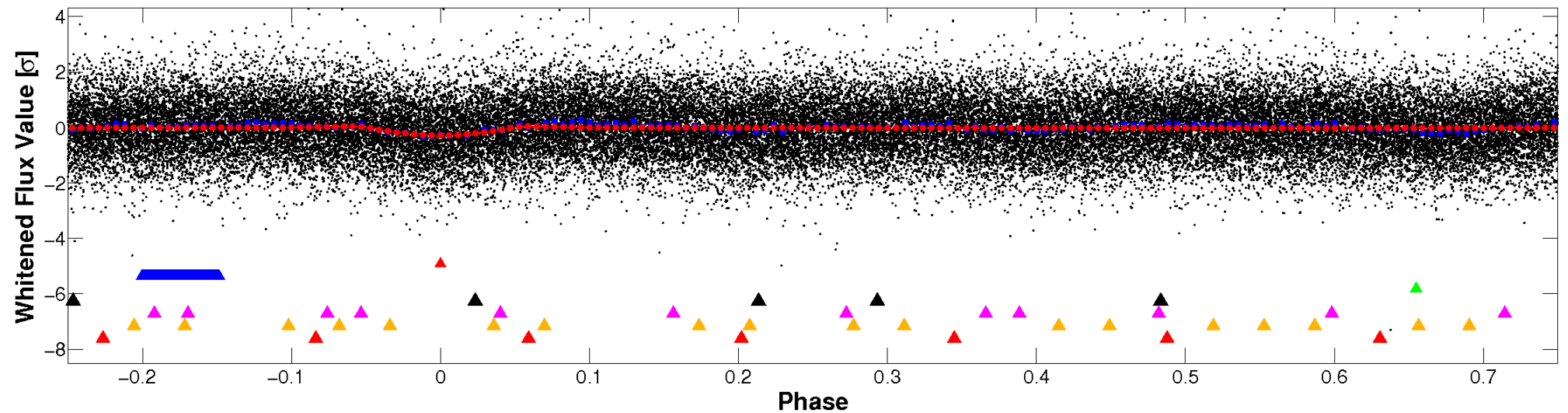


# Non-Whitened Vs. Whitened Light Curve

## Planet 1 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

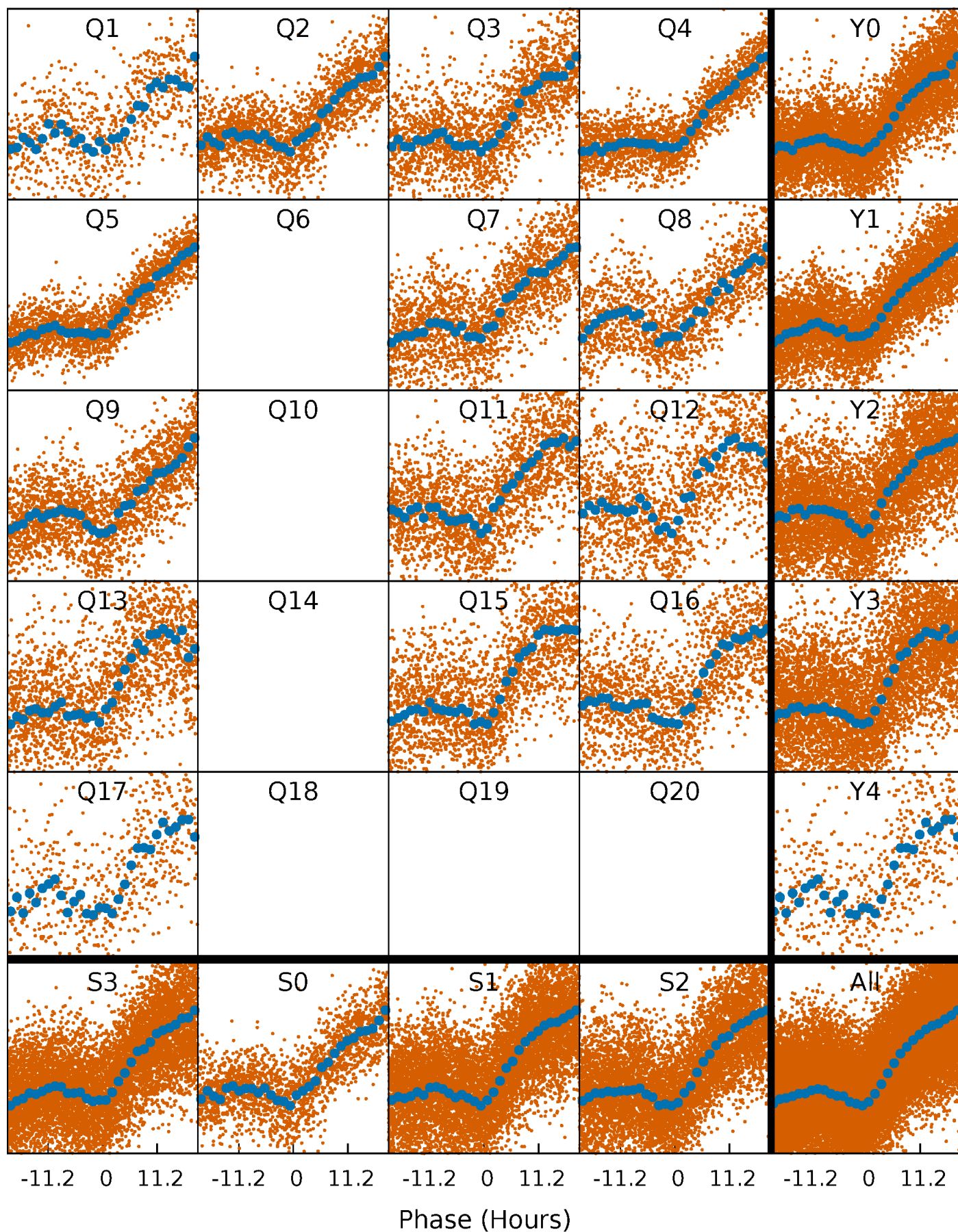


## Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

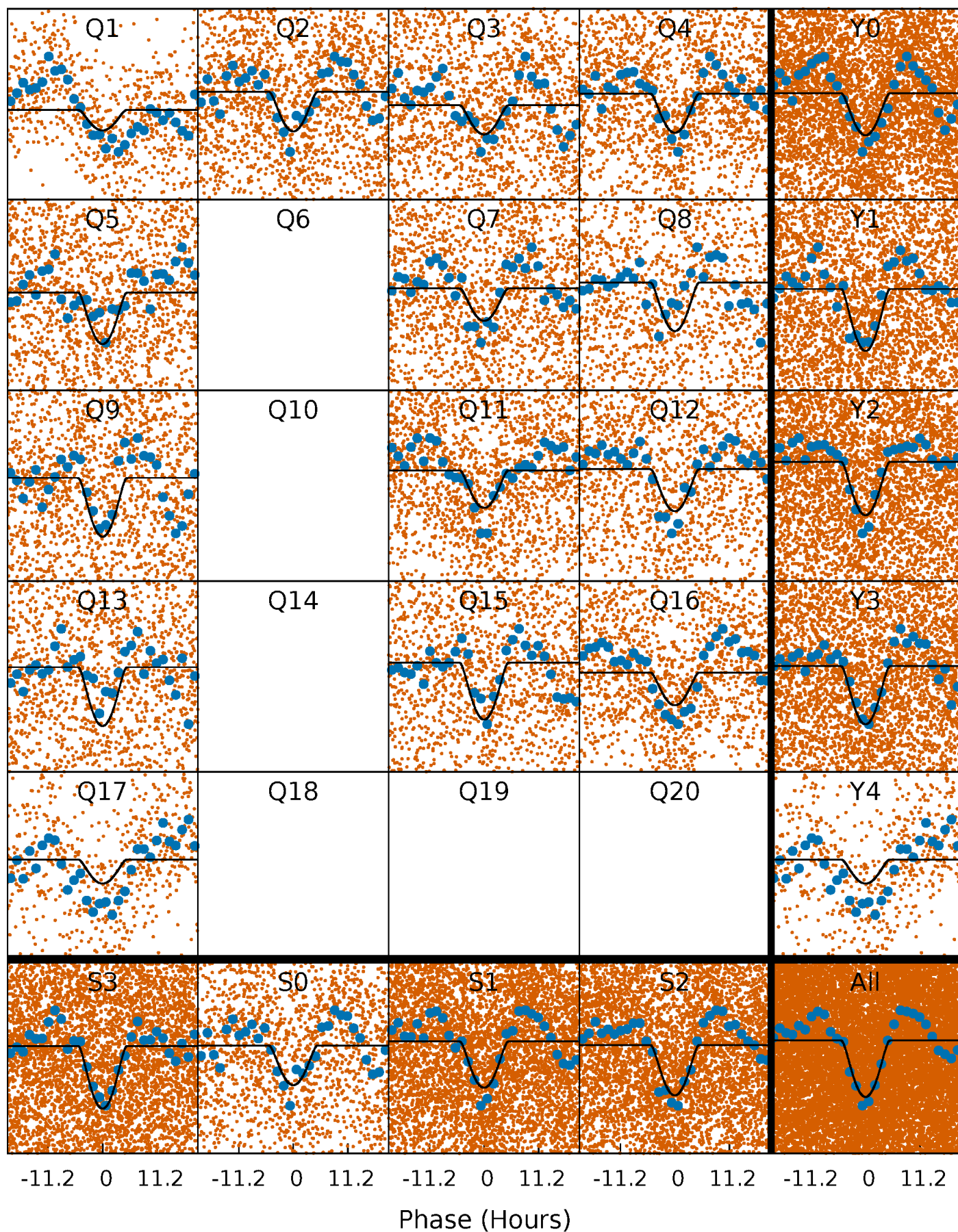
TCE 003247616-01 P= 3.471928 Days  $T_0=132.100191$  (BKJD)





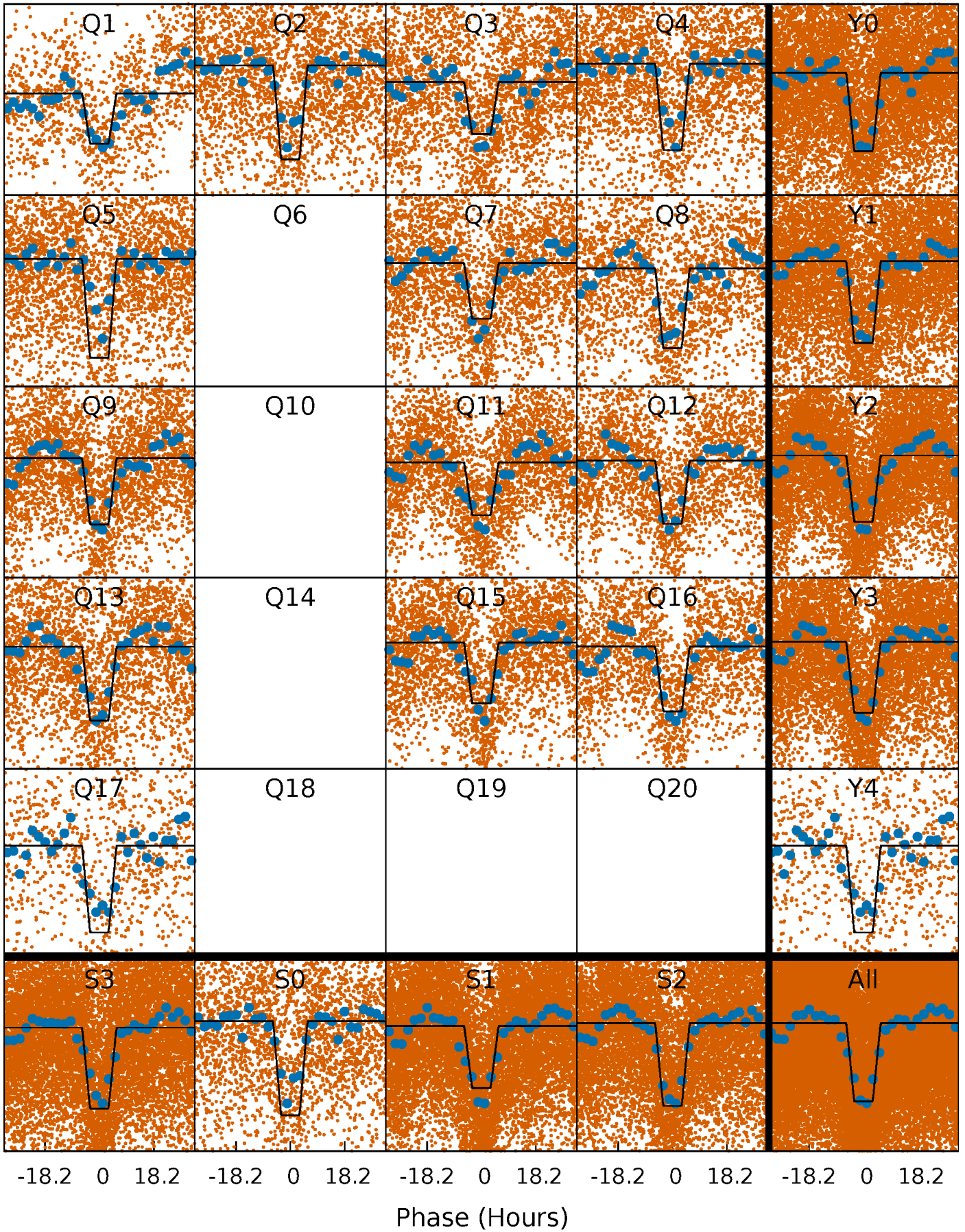
# DV Quarter-Phased Transit Curves

TCE 003247616-01 P= 3.471928 Days  $T_0=132.100191$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 003247616-01 P= 3.471865 Days  $T_0=132.111525$  (BKJD)

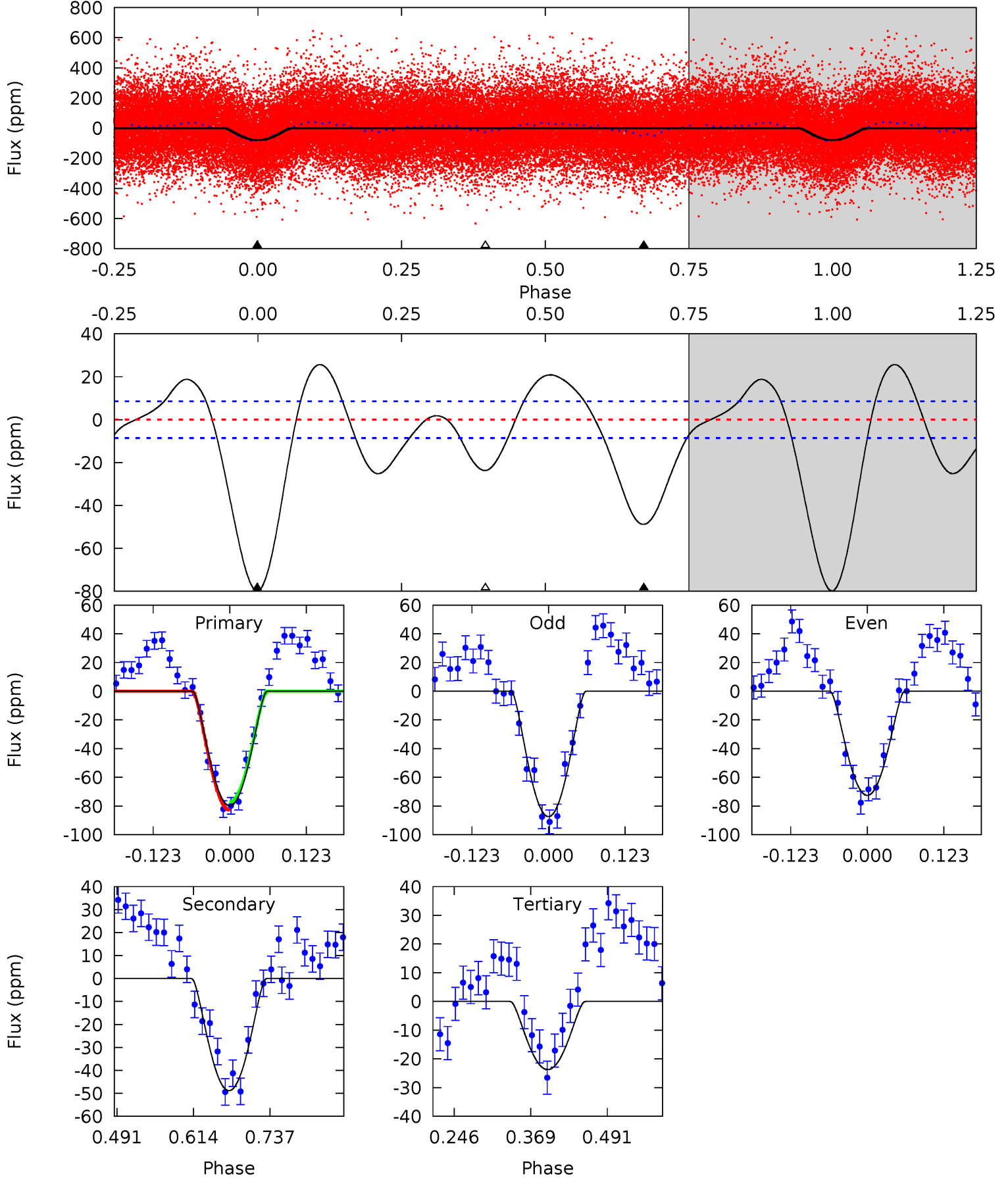




# DV Model-Shift Uniqueness Test

003247616-01, P = 3.471928 Days, E = 128.628263 Days

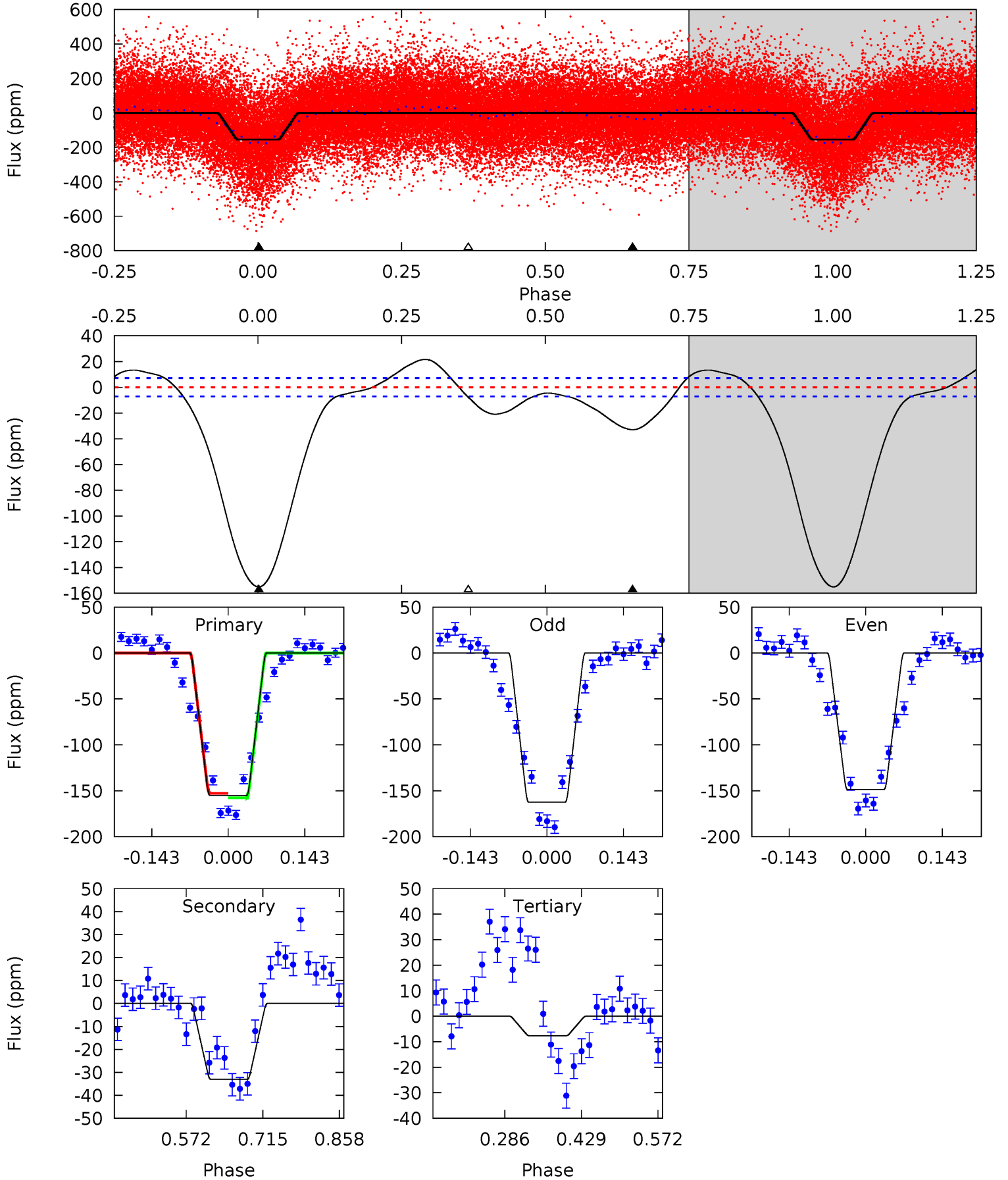
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
42.1	25.8	12.5	0	4.52	1.54	7.78	29.6	42.1	13.2	25.8	3.91	1.08	0.24	1.49



# Alt Model-Shift Uniqueness Test

003247616-01, P = 3.471865 Days, E = 128.639660 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
97.6	20.8	4.82	0	4.49	1.46	7.83	92.8	97.6	16.0	20.8	4.32	0.99	0.12	1.54





### Stellar Parameters For KIC 003247616

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6915^{+187}_{-229}$	$3.665^{+0.315}_{-0.074}$	$-0.220^{+0.300}_{-0.250}$	$3.127^{+0.390}_{-1.091}$	$1.651^{+0.208}_{-0.312}$	$0.076^{+0.155}_{-0.018}$
	+3%/-3%	+9%/-2%	+136%/-114%	+12%/-35%	+13%/-19%	+204%/-24%
Source	PHO1	FLK73	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 003247616-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-49 \pm 2$	$5.76^{+4.93}_{-3.78}$	$3200^{+168}_{-287}$	$4316^{+2836}_{-1023}$	$2.262^{+18.207}_{-1.592}$
Alt.	$-33 \pm 2$	$5.81^{+4.65}_{-3.90}$	$3192^{+183}_{-279}$	$3989^{+2605}_{-1042}$	$1.570^{+12.281}_{-1.091}$

$T_{\text{max}}$  = Theoretical Maximum Planetary Temperature

$T_{\text{obs}}$  = Observed Planetary Temperature (Assuming A=0.3)

$A_{\text{obs}}$  = Observed Albedo (Assuming T=0)

If a secondary eclipse is present, the system is likely an EB if  $T_{\text{obs}} \gg T_{\text{max}}$  AND  $A_{\text{obs}} \gg 1.0$

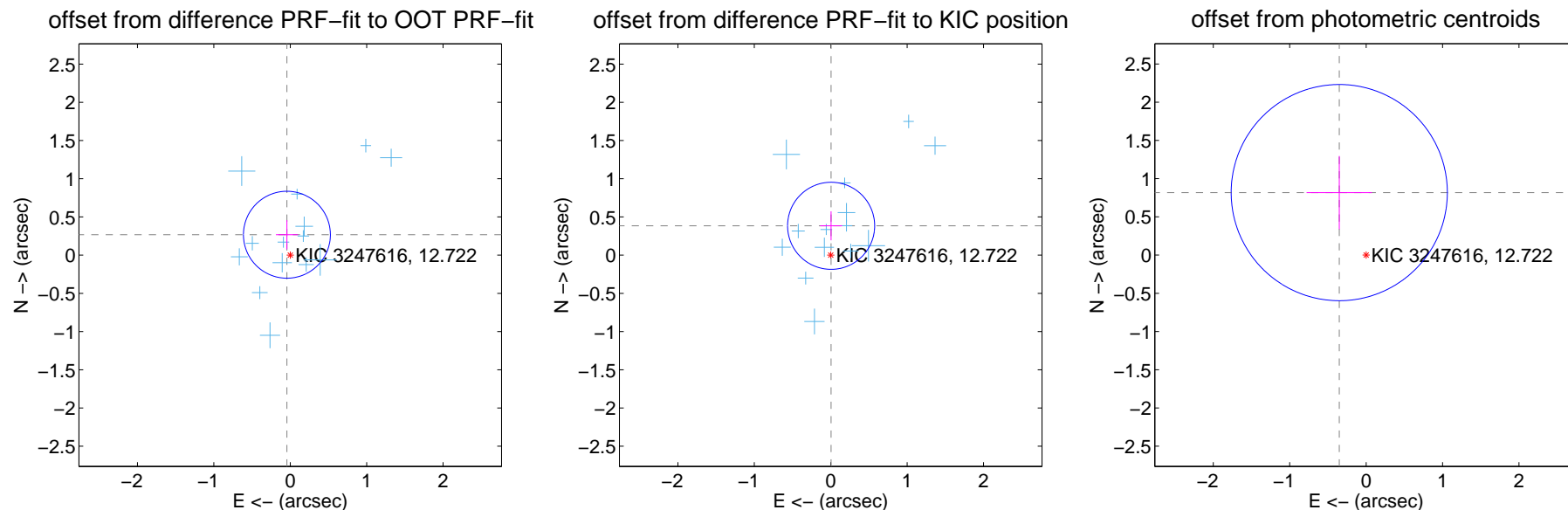
## DV Centroid Data

Supplemental centroid analysis for 003247616-01. Kepler magnitude: 12.72. Transit SNR 14.48

There are 14 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.22 arcsec

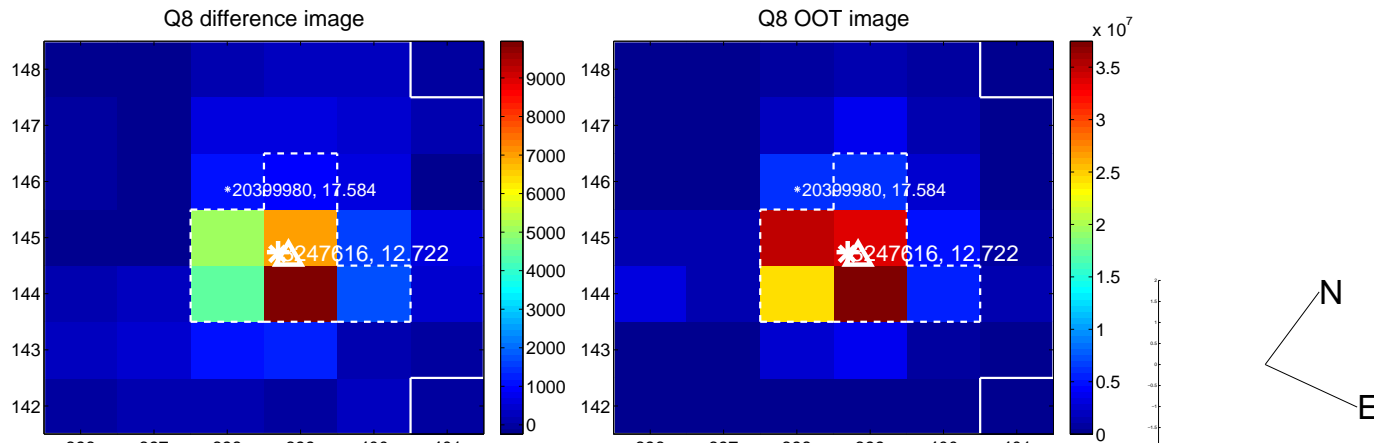
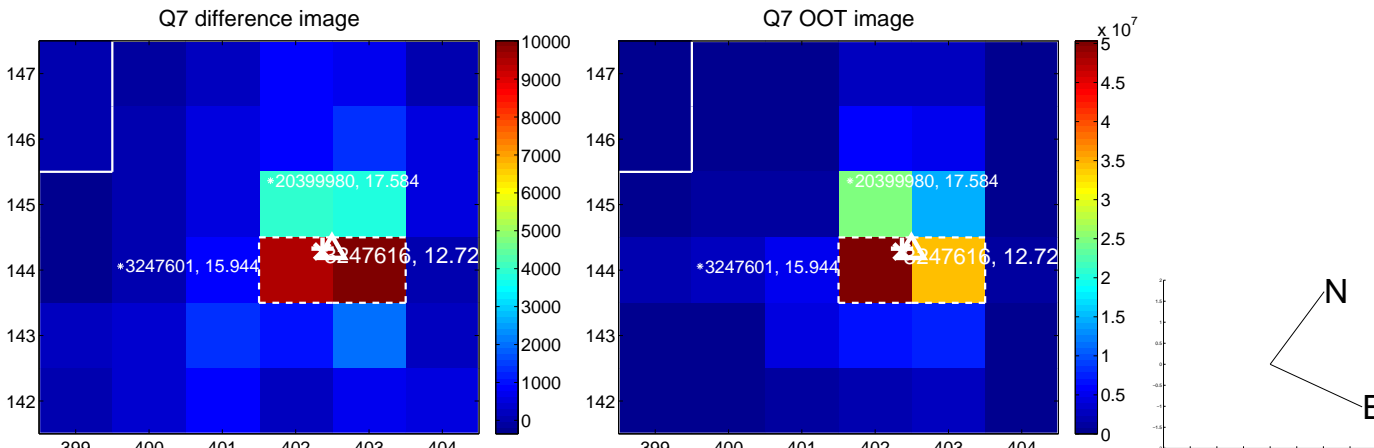
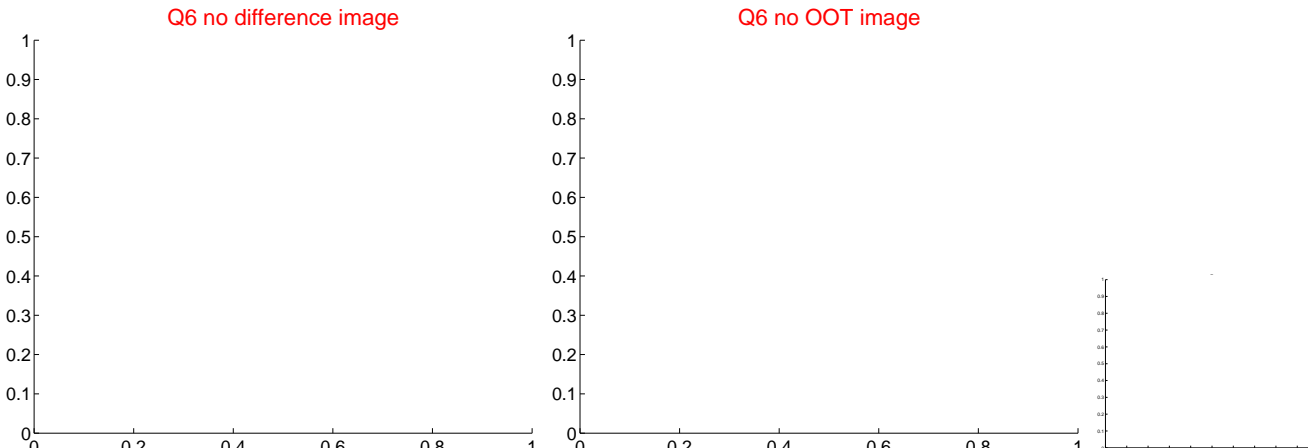
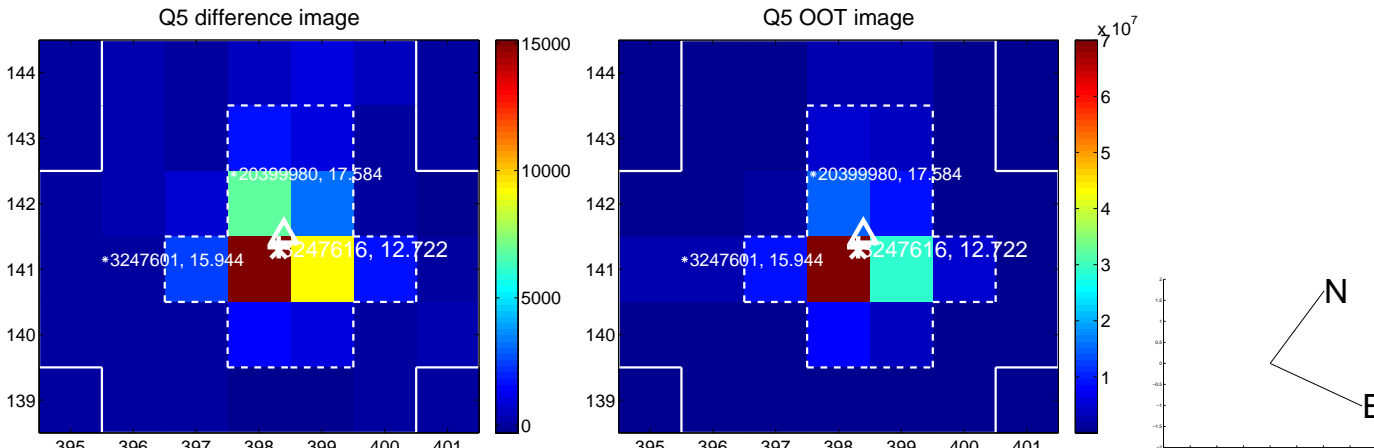
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.271 \pm 0.190$	1.43	$0.044 \pm 0.144$	$0.267 \pm 0.191$
PRF-fit source offset from KIC position	$0.384 \pm 0.190$	2.02	$-0.005 \pm 0.144$	$0.384 \pm 0.190$
photometric centroid source offset	$0.89 \pm 0.47$	1.89	$0.35 \pm 0.43$	$0.82 \pm 0.48$



Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

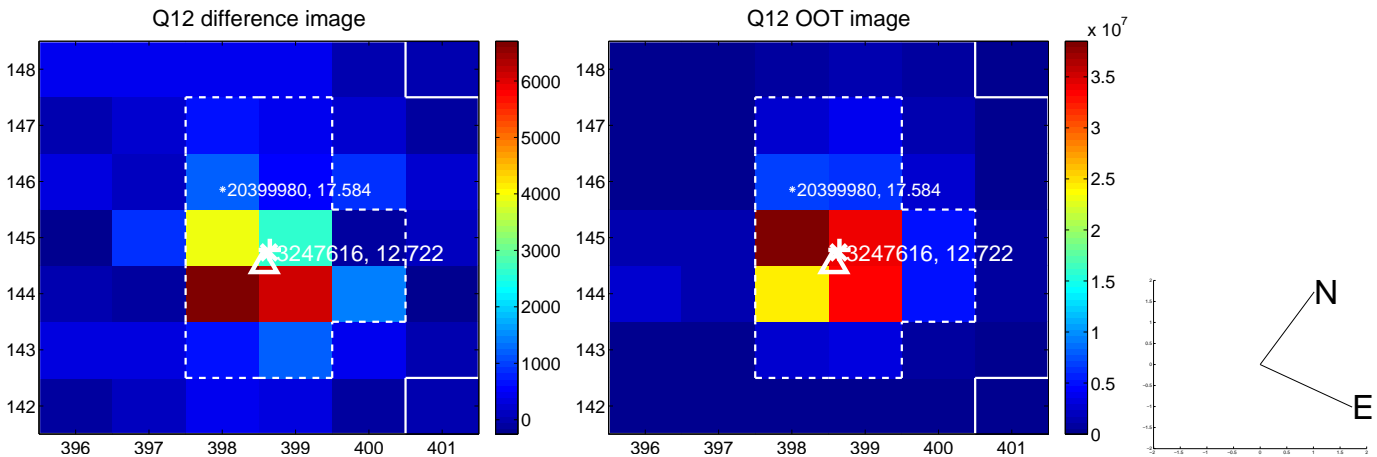
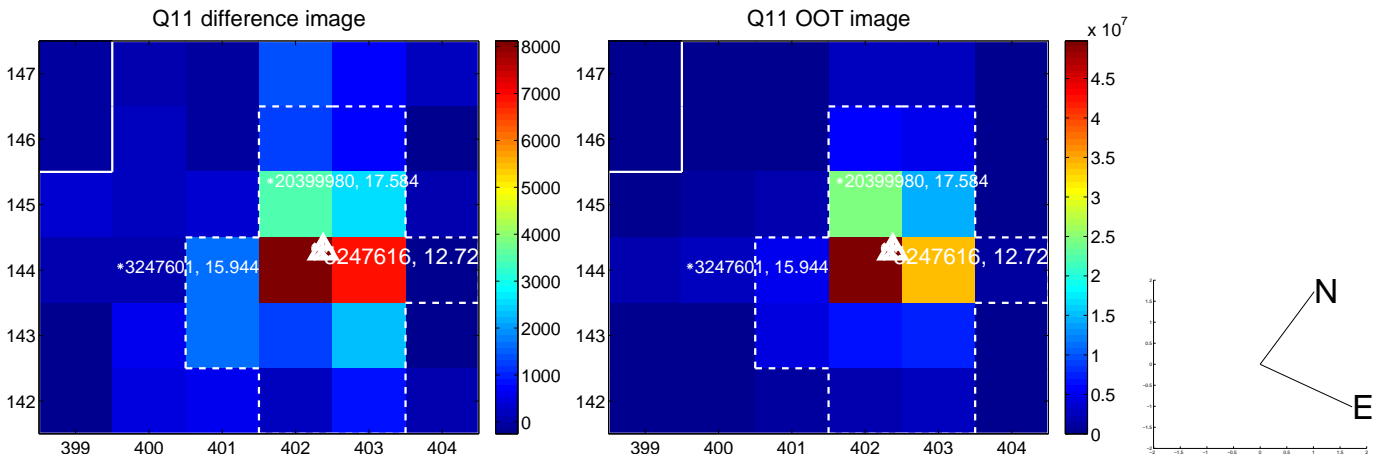
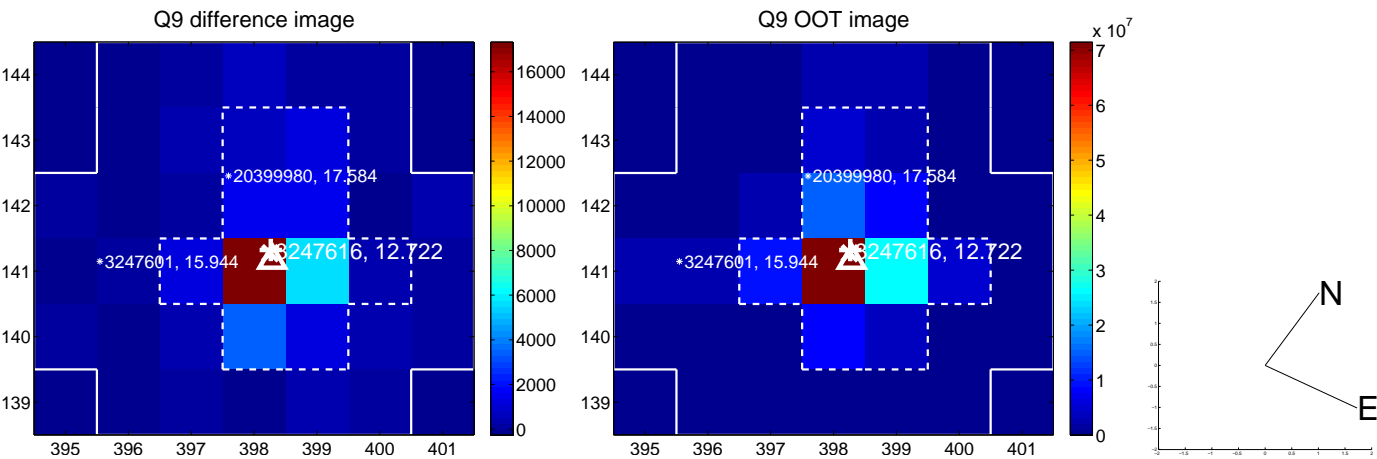


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value

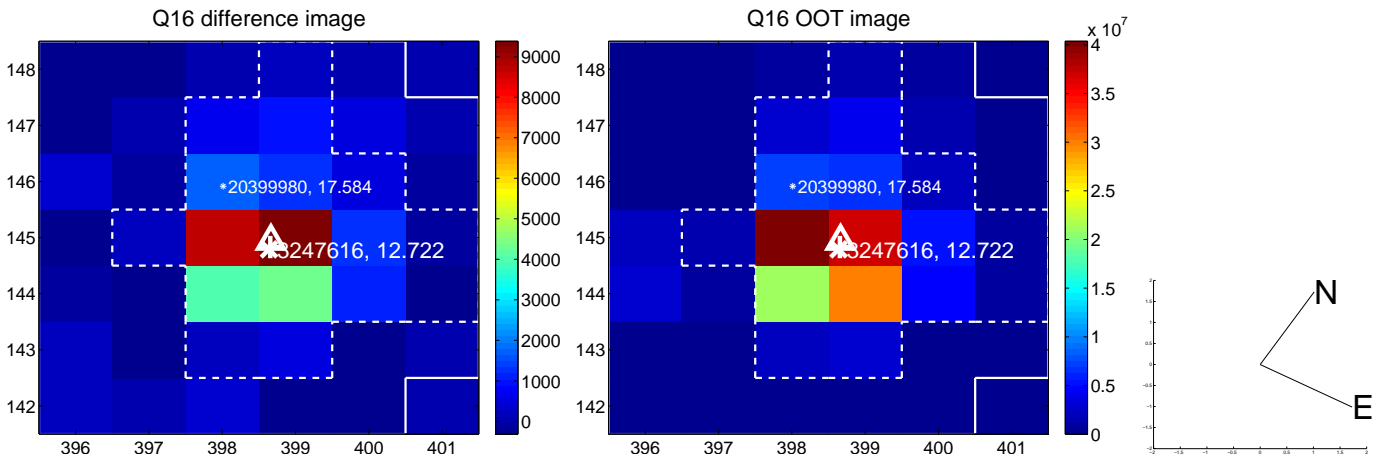
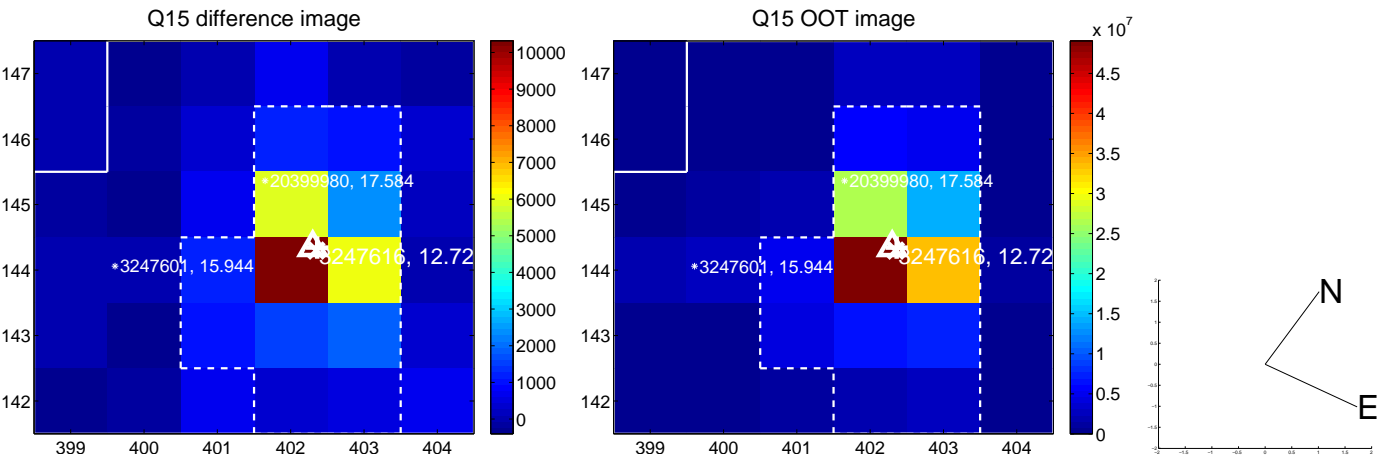
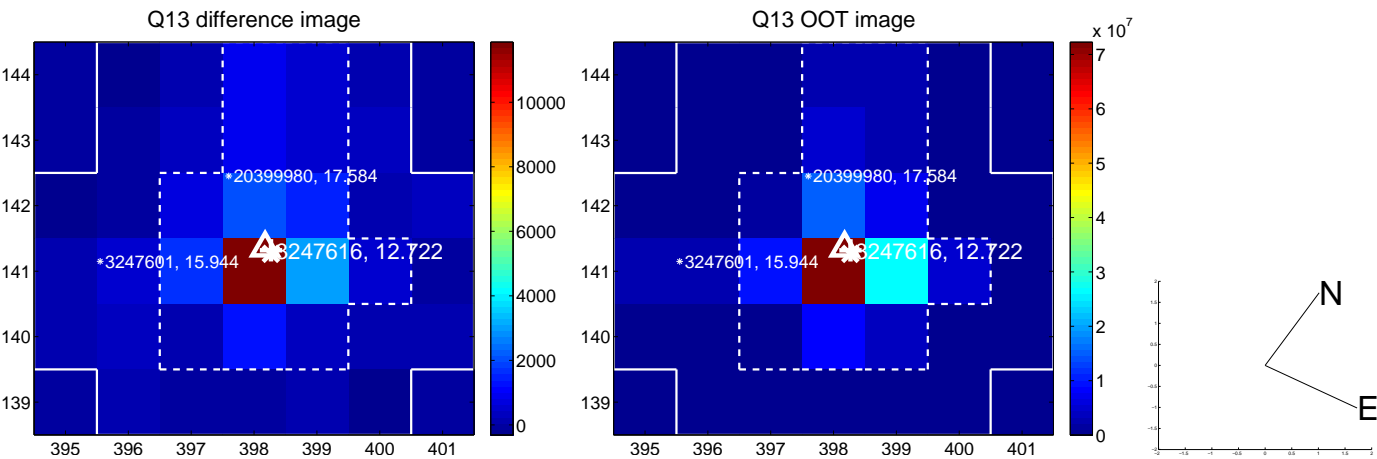




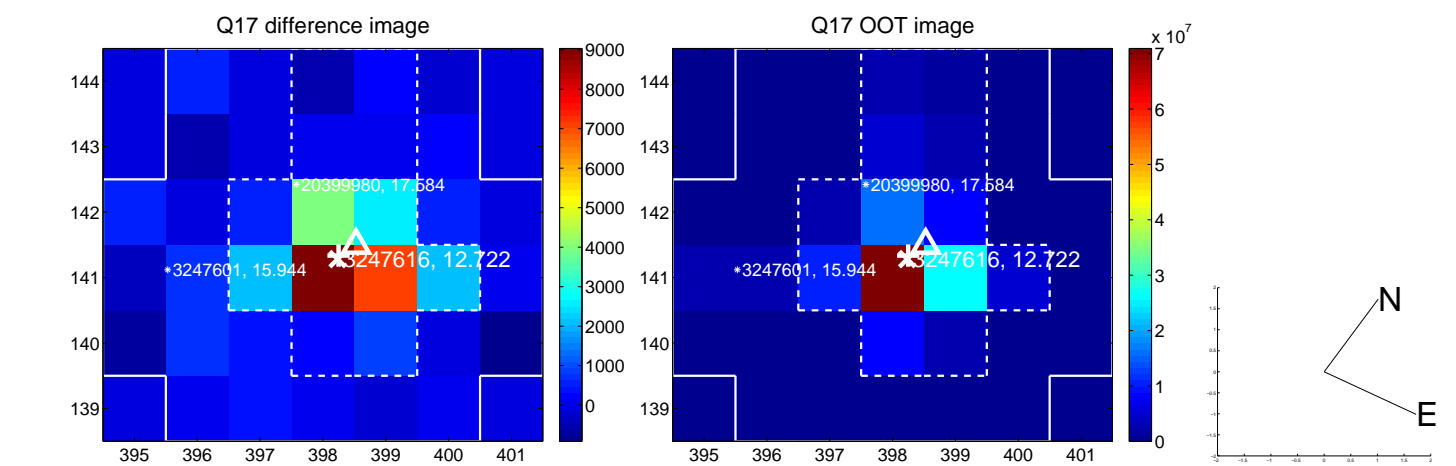
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



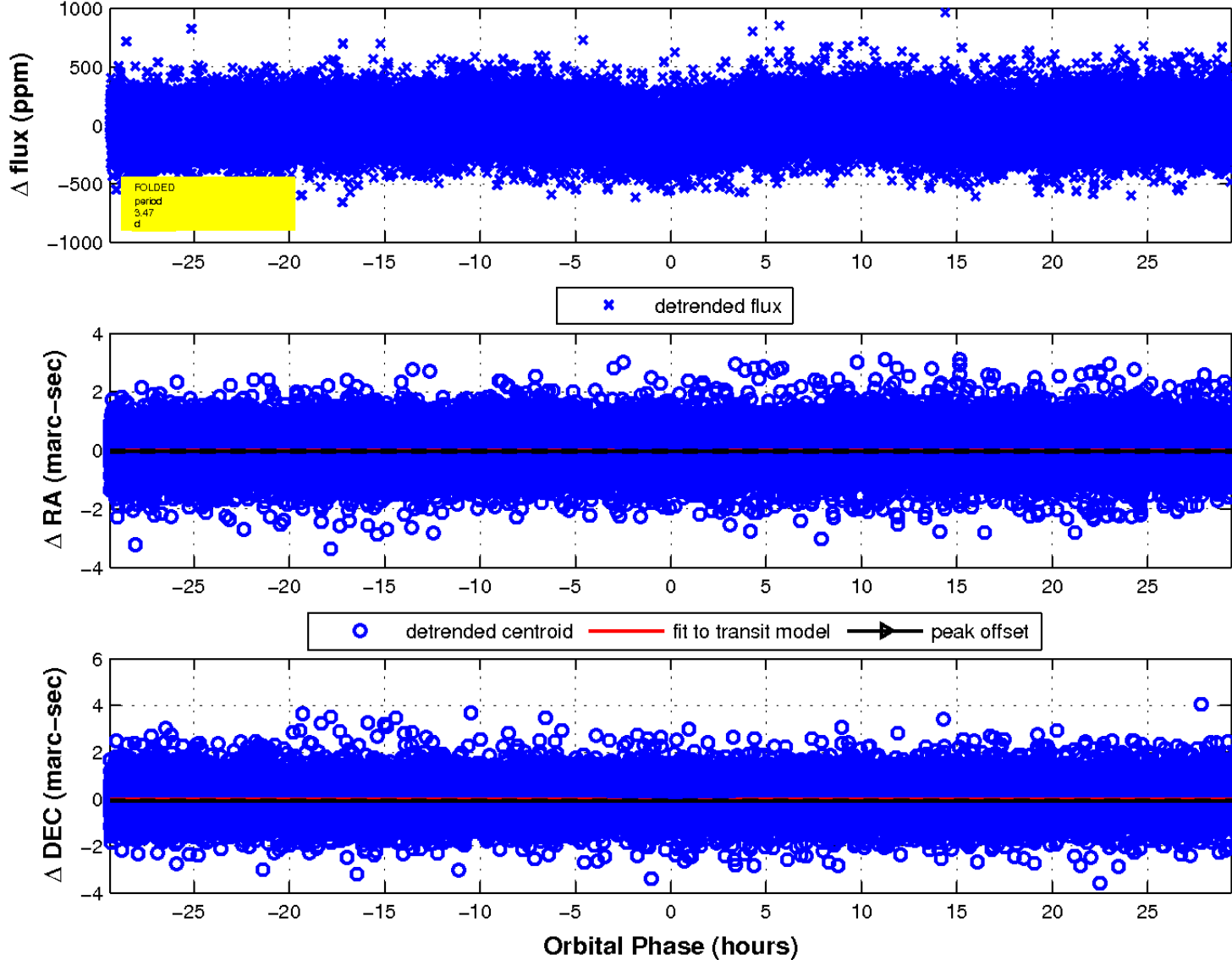
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

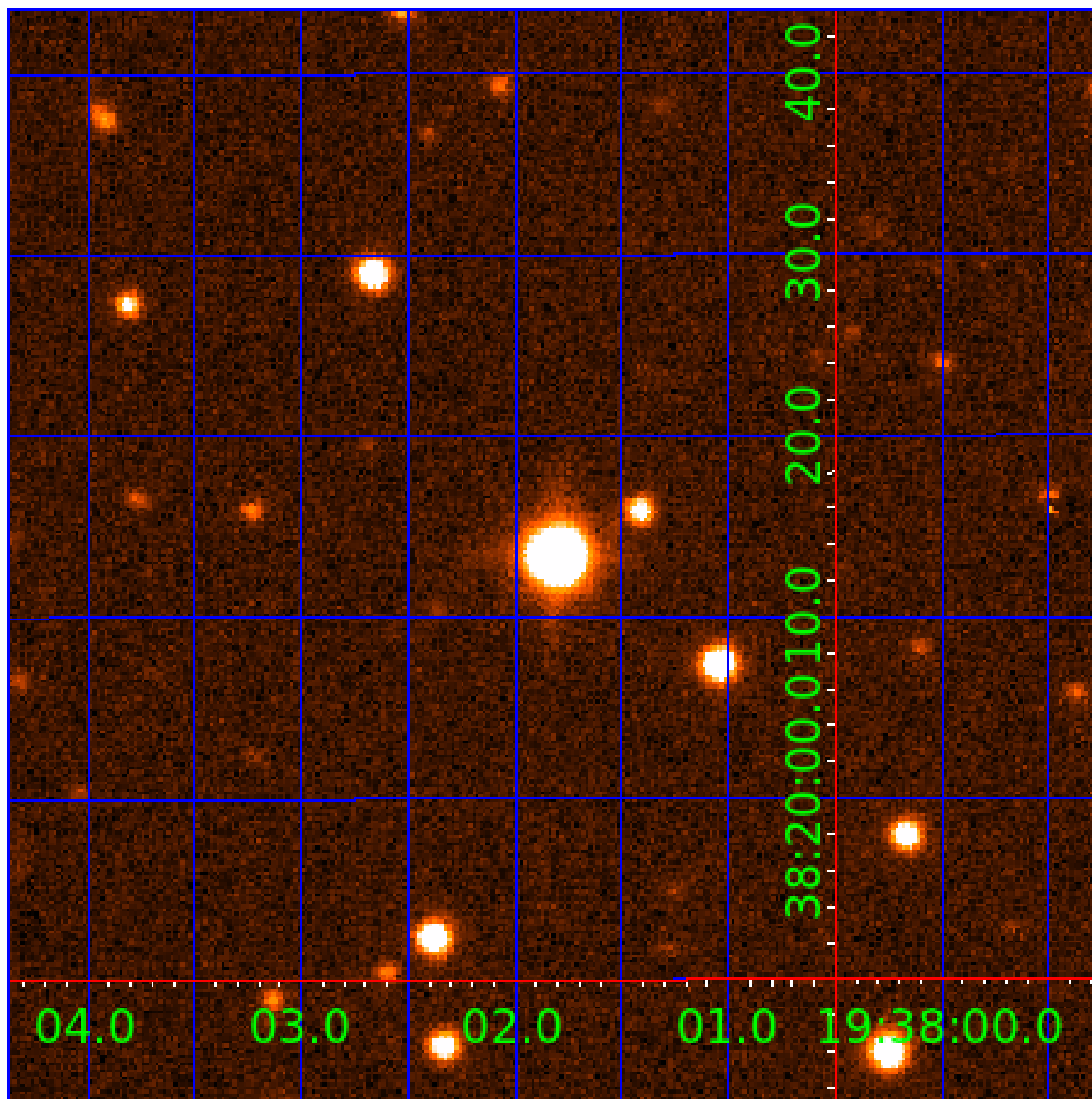


fluxWeightedCentroids, Planet 1 of 7



UKIRT Image

Declination



# KIC 003247616

## Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	$R_{\star}$ ( $R_{\odot}$ )	$T_{\star}$ (K)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003247616-01	OBS	No	3.471928	132.100191	70.7	9.800	12.2	14.5	3.13	6915	4.99	7123.95
003247616-02	OBS	No	3.472358	134.876085	0.0	6.691	10.0	0.0	3.13	6915	0.01	7122.77
003247616-03	OBS	No	3.471931	134.373317	32.8	8.764	8.9	9.3	3.13	6915	2.22	7123.94
003247616-04	OBS	No	289.107157	379.348536	246.4	21.063	11.6	7.5	3.13	6915	5.82	19.59
003247616-05	OBS	No	126.523774	180.521913	349.7	3.437	8.5	9.1	3.13	6915	6.71	58.96
003247616-06	OBS	No	81.171074	206.811883	195.3	4.351	7.5	7.3	3.13	6915	4.94	106.56
003247616-07	OBS	No	148.796891	198.768348	291.8	4.044	7.3	7.9	3.13	6915	7.04	47.50

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003247616-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV
003247616-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—SWEET_NTL—LPP_DV—SAME_NTL_PERIOD—CENT_FEW_DIFFS
003247616-03	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—SAME_NTL_PERIOD
003247616-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
003247616-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT
003247616-06	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
003247616-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

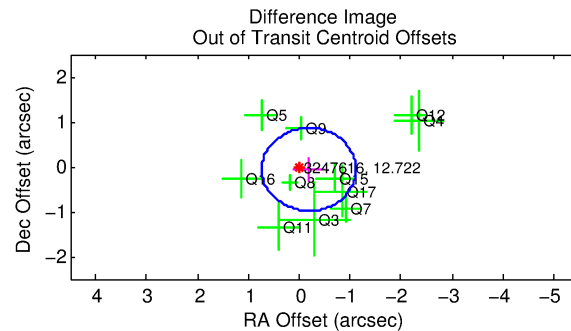
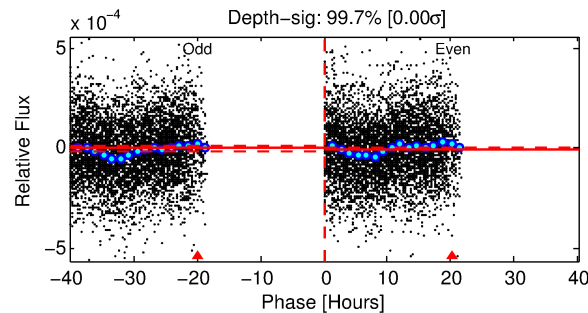
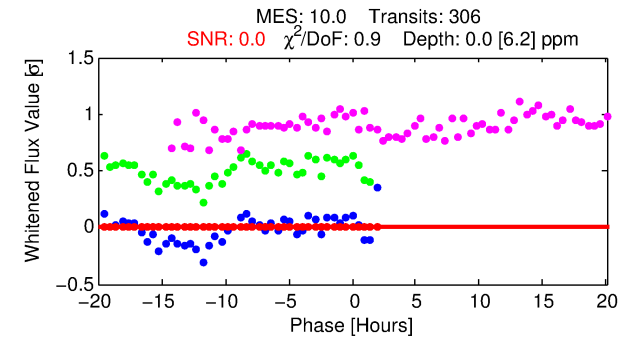
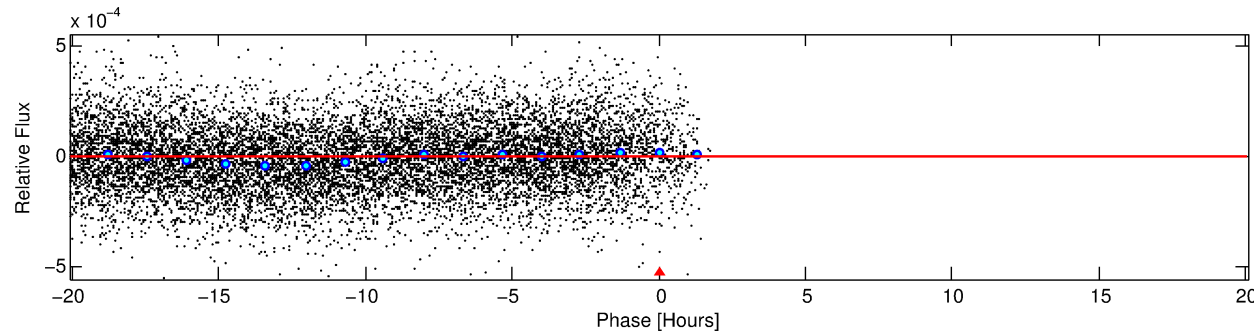
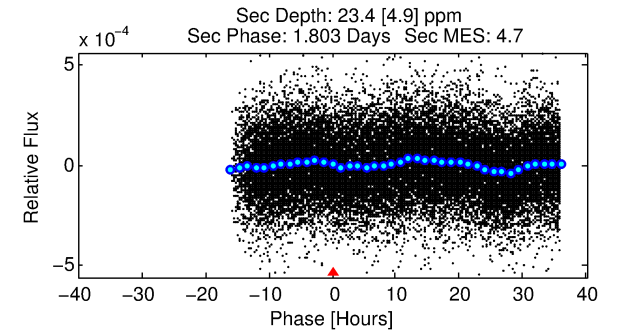
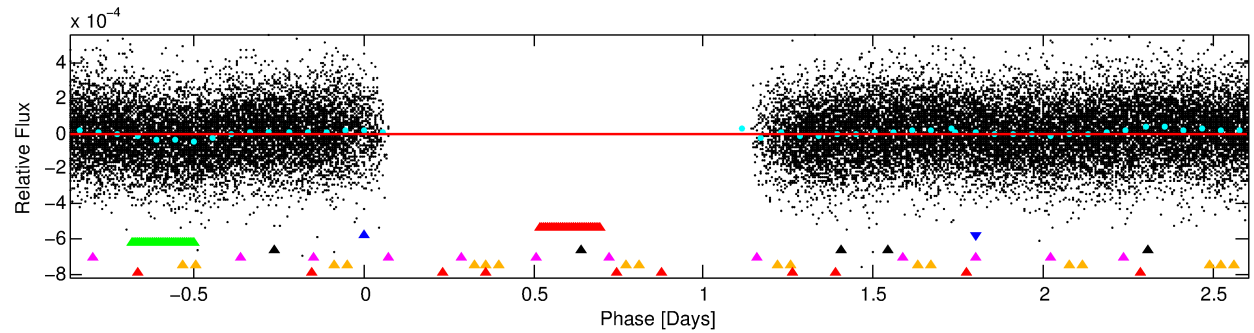
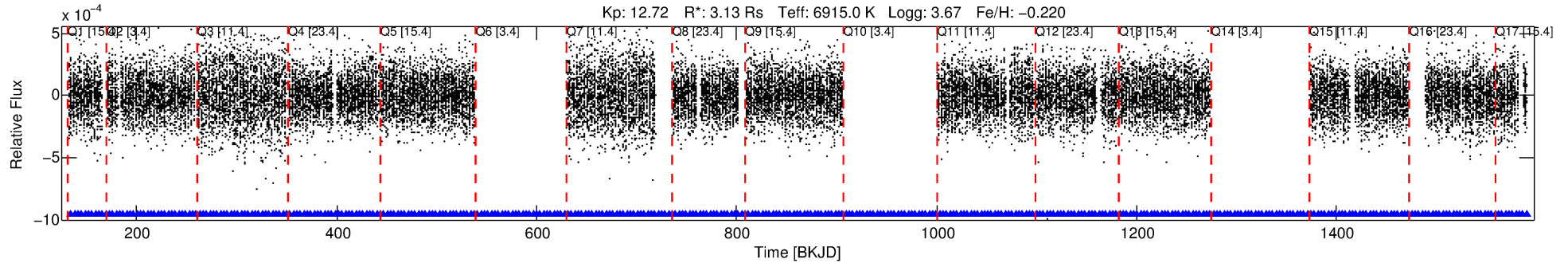
Ephemeris Match Information For 003247616-02

No Significant Match Found



# DV One-Page Summary

KIC: 3247616 Candidate: 2 of 7 Period: 3.472 d



## DV Fit Results:

Period = 3.47236 [1.19385] d  
Epoch = 134.8761 [218.3228] BKJD  
Rp/R\* = 0.0000 [0.0825]  
a/R\* = 2.92 [348.25]  
b = 0.71 [319.88]  
Seff = 7122.77 [5114.58]  
Teq = 2343 [421] K  
Rp = 0.01 [28.17] Re  
a = 0.0530 [0.0215] AU  
Ag = 233788.70 [1057766821.98] [0.00σ]  
Teffp = 79641 [90085880] K [0.00σ]

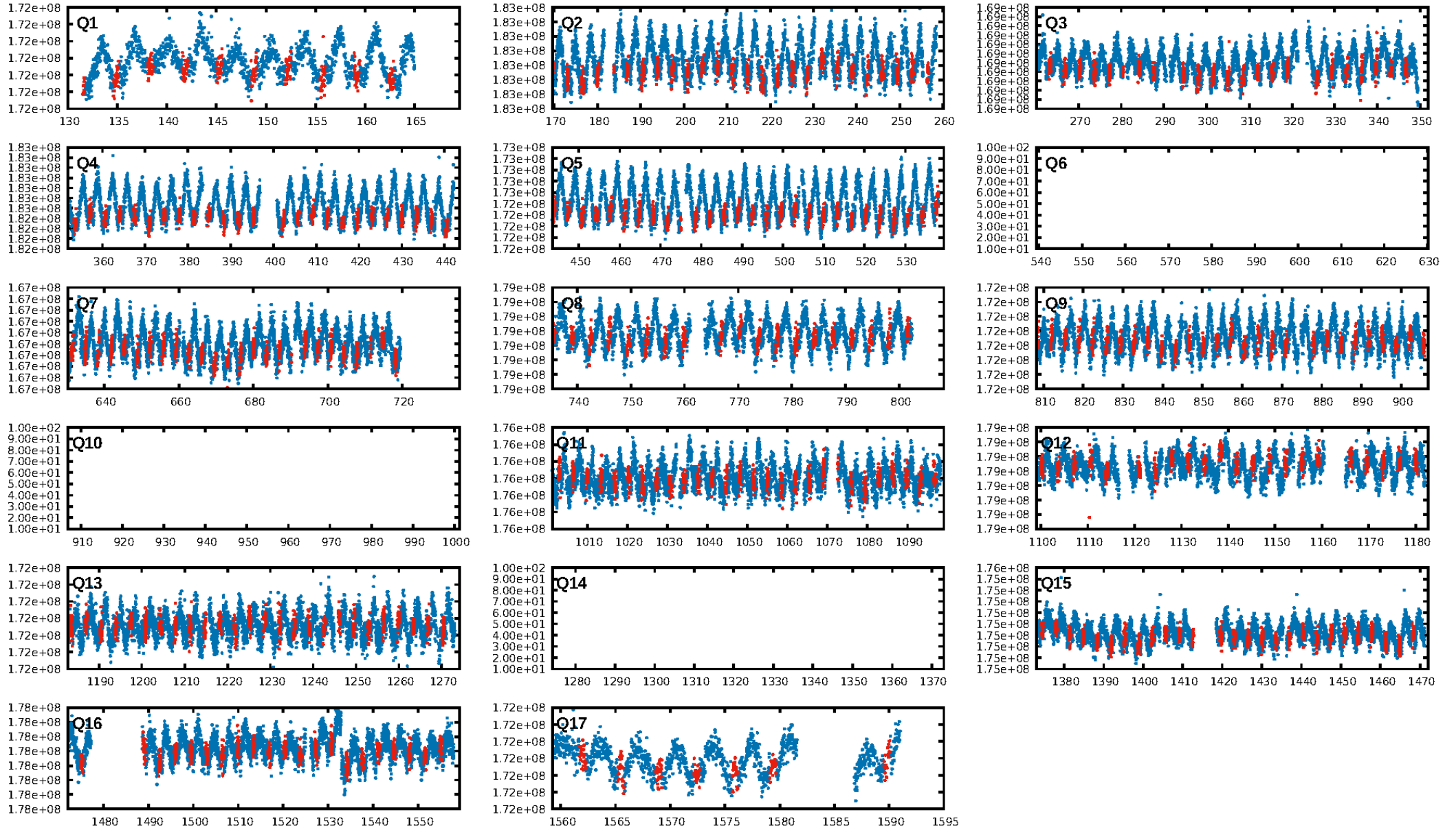
## DV Diagnostic Results:

ShortPeriod-sig: 0.1% [0.00σ]  
LongPeriod-sig: 100.0% [233.65σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 7.82e-14  
RollingBand-fgt: 1.00 [290/290]  
GhostDiagnostic-chr: N/A  
Centroid-sig: N/A  
Centroid-so: N/A  
OotOffset-rm: 0.197 arcsec [0.64σ]  
KicOffset-rm: 0.257 arcsec [0.75σ]  
OotOffset-st: 0/4/4/3 [11]  
KicOffset-st: 0/4/4/3 [11]  
DiffImageQuality-fgm: 0.00 [0/11]  
DiffImageOverlap-fno: 0.00 [0/14]

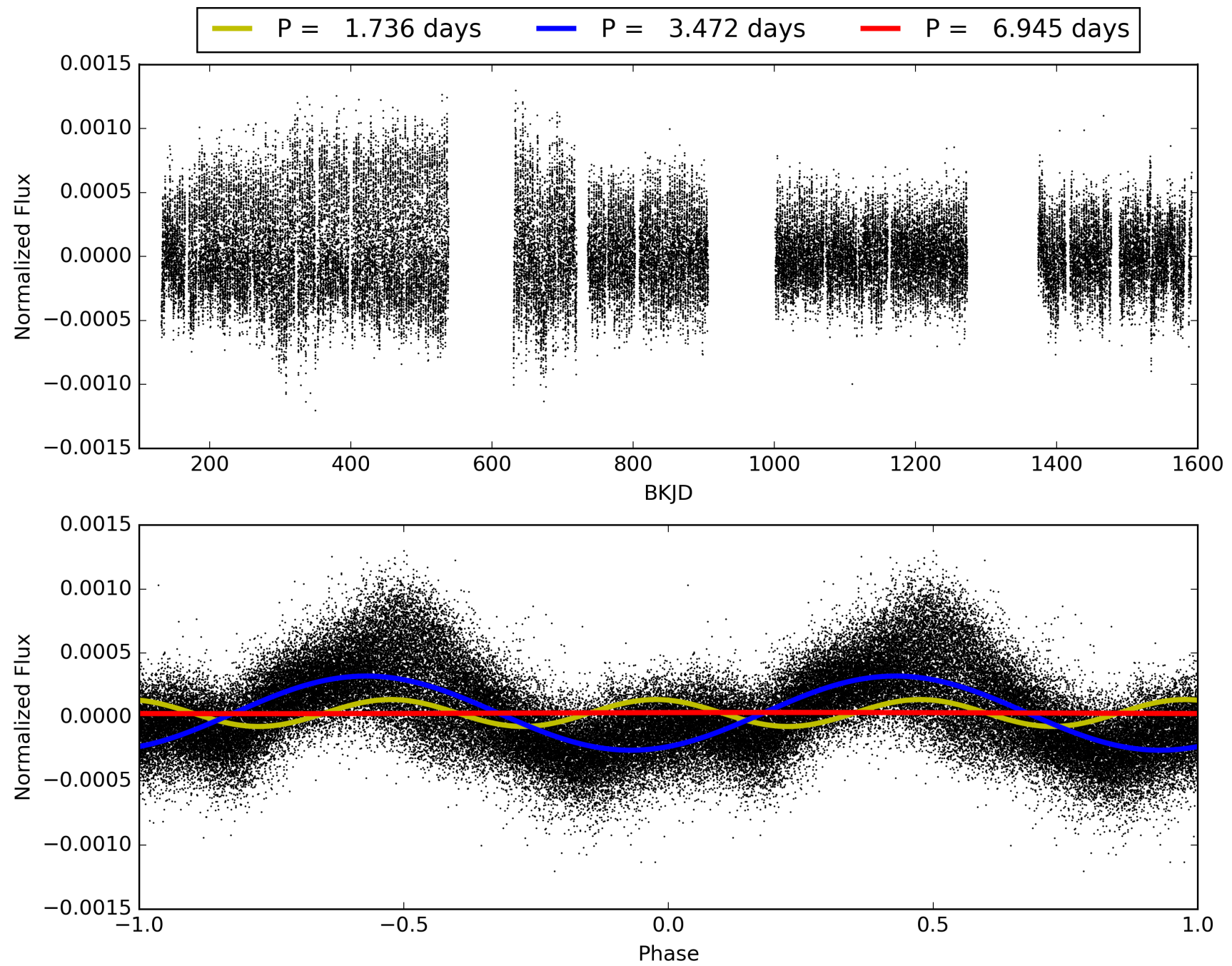
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 13:10:03 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 003247616-02, PDC Light Curves

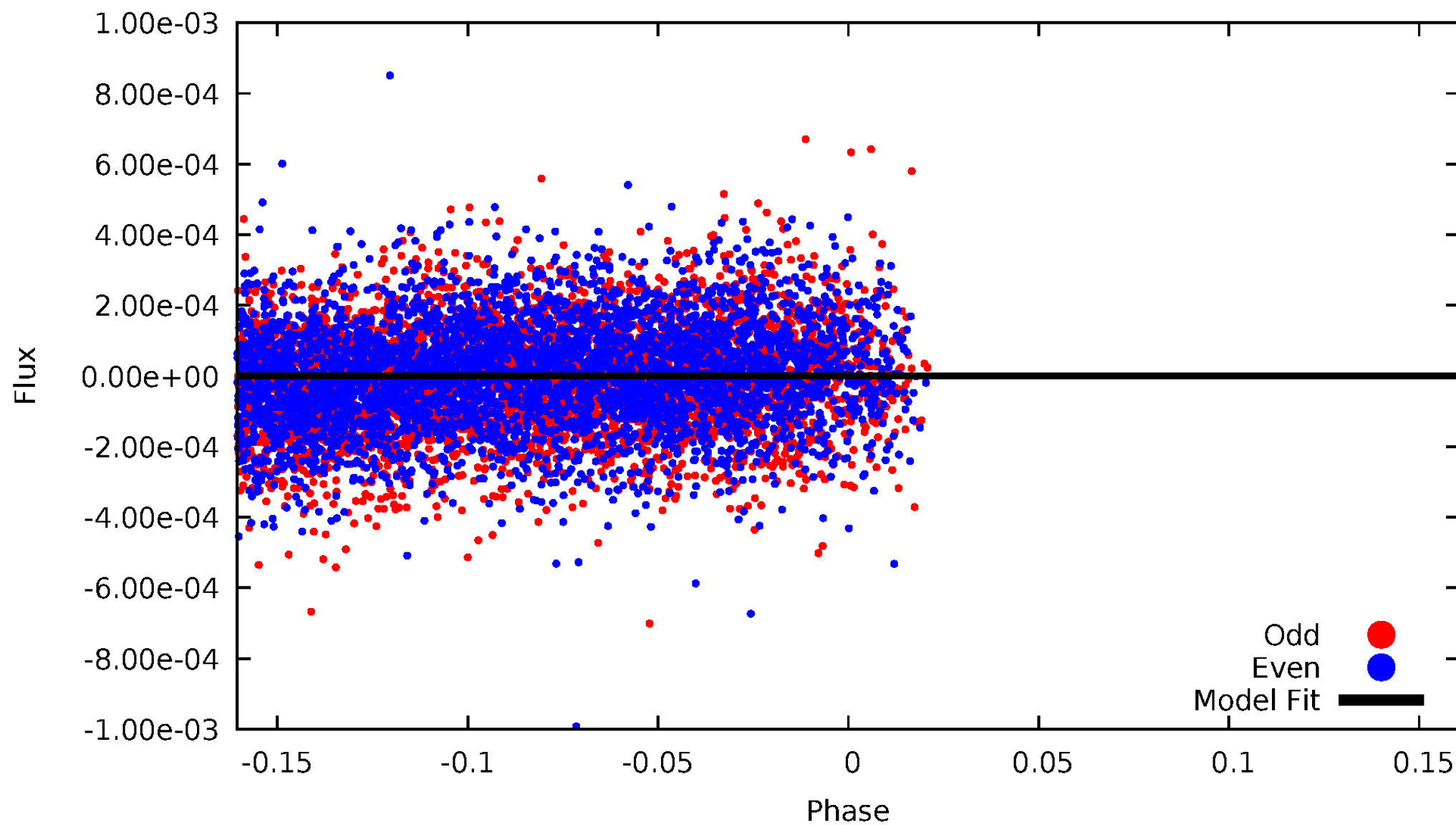


TCE 003247616-02



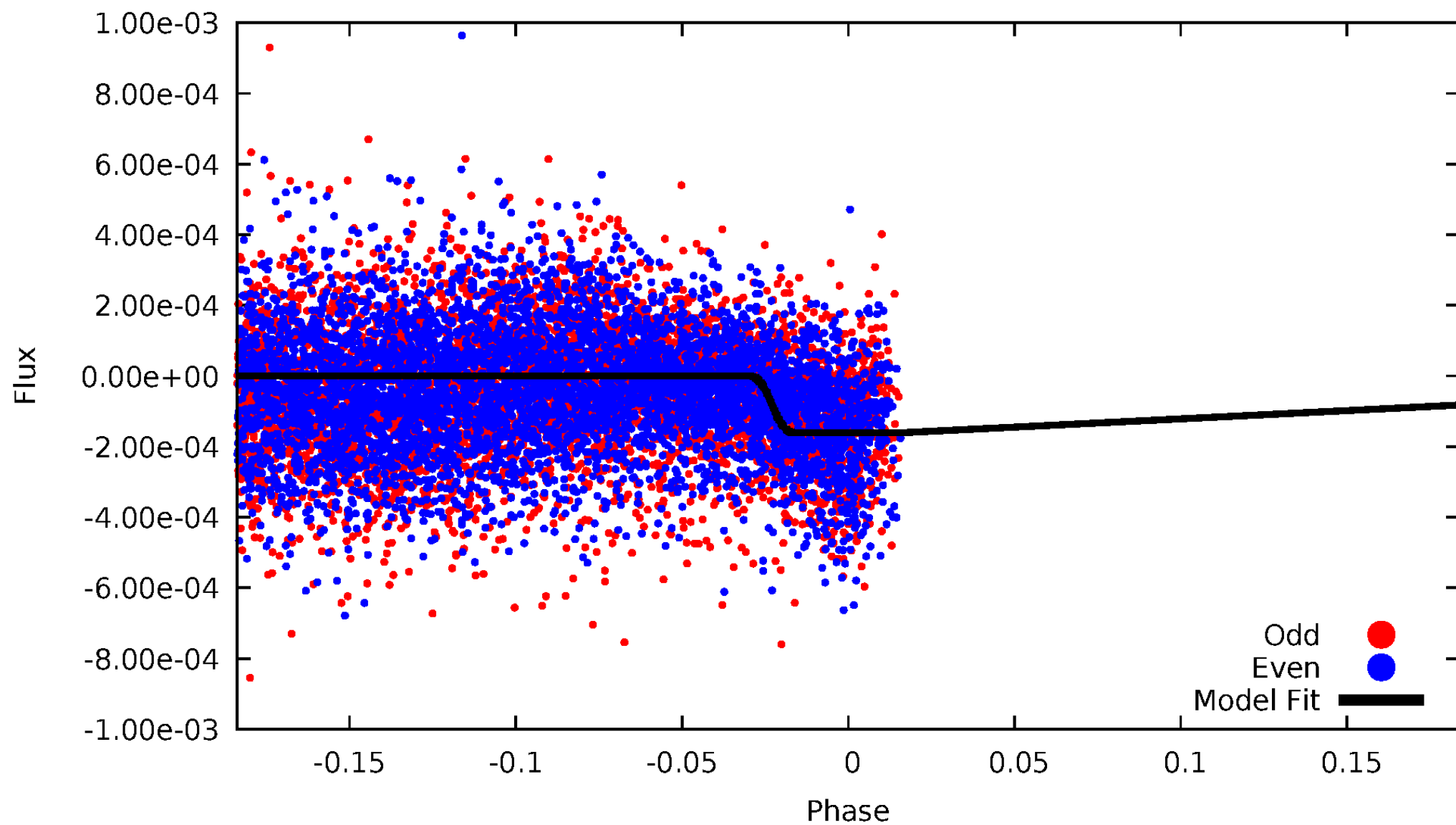
DV Odd/Even

TCE 003247616-02



# ALT Odd/Even

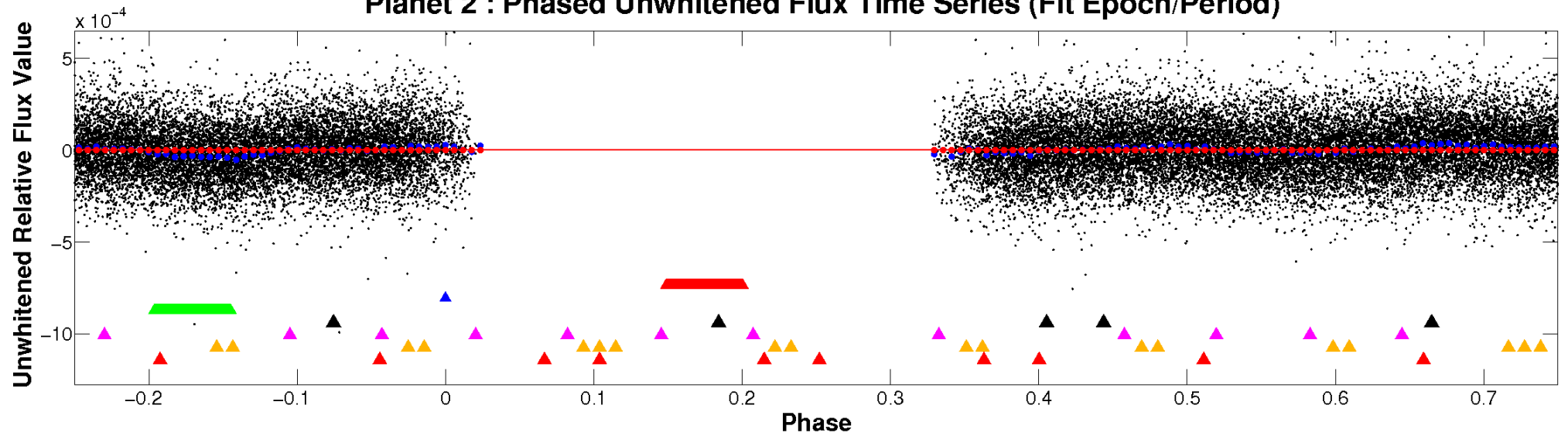
TCE 003247616-02



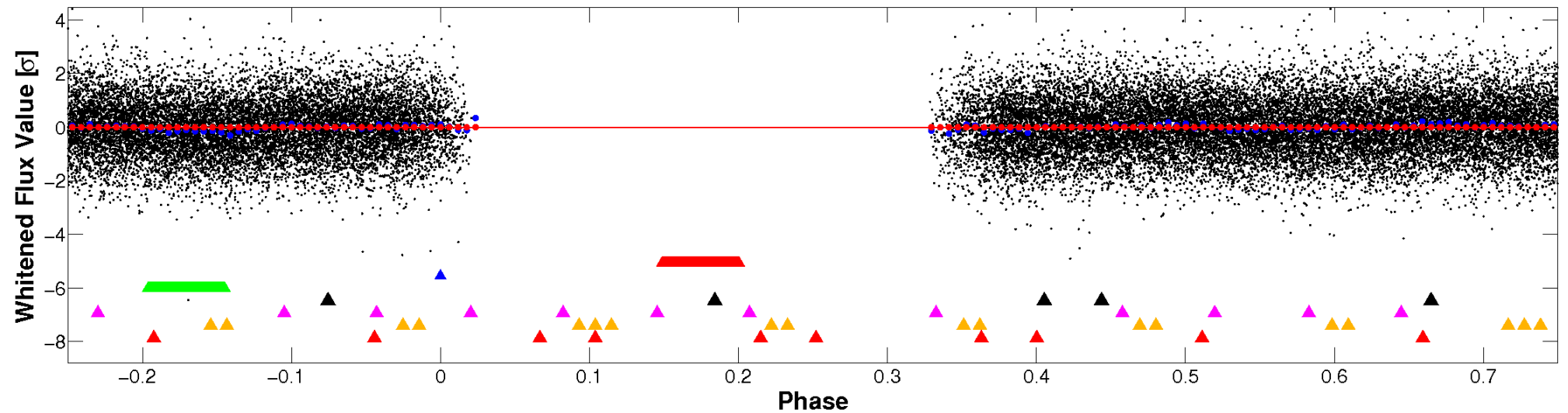


# Non-Whitened Vs. Whitened Light Curve

## Planet 2 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

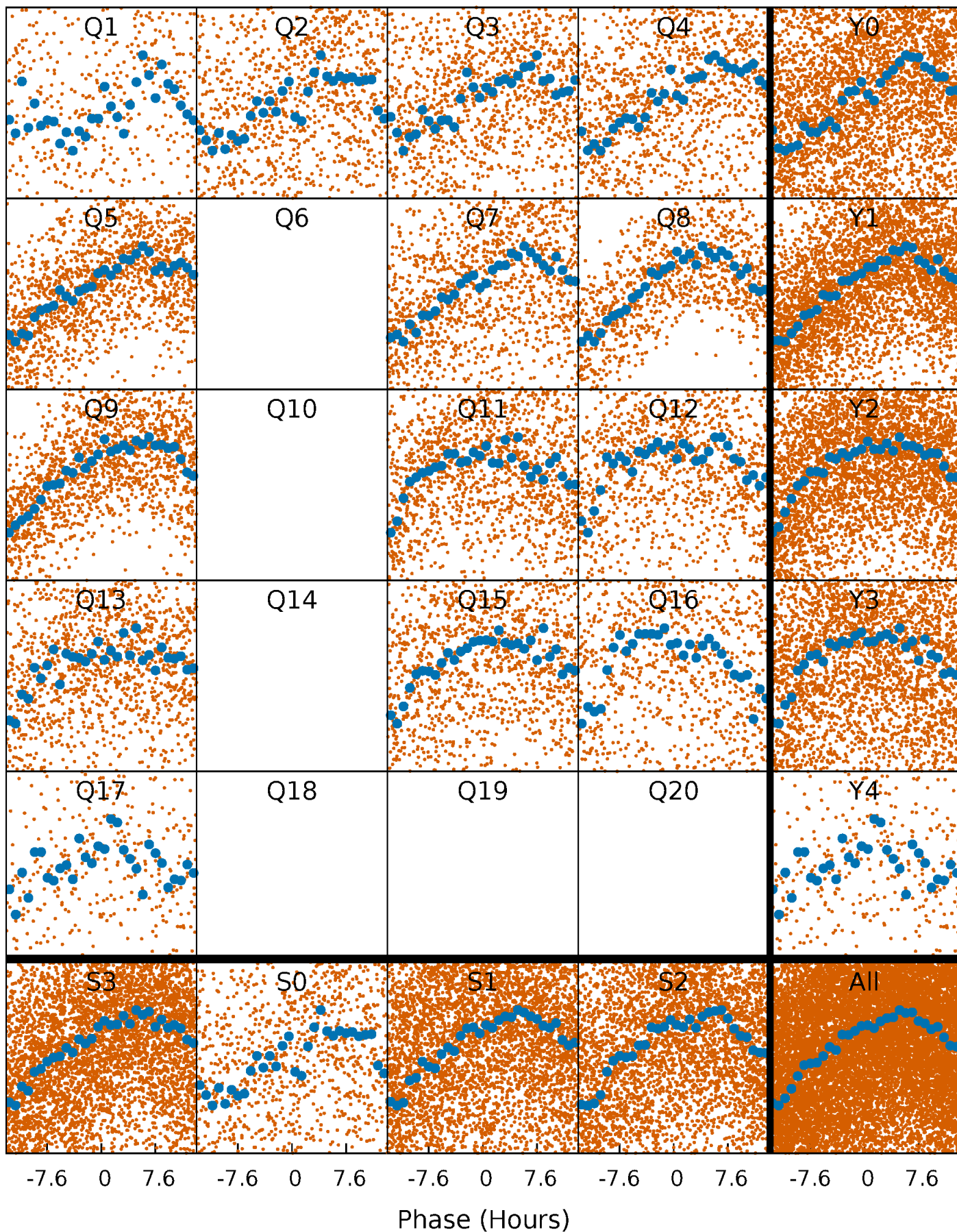


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



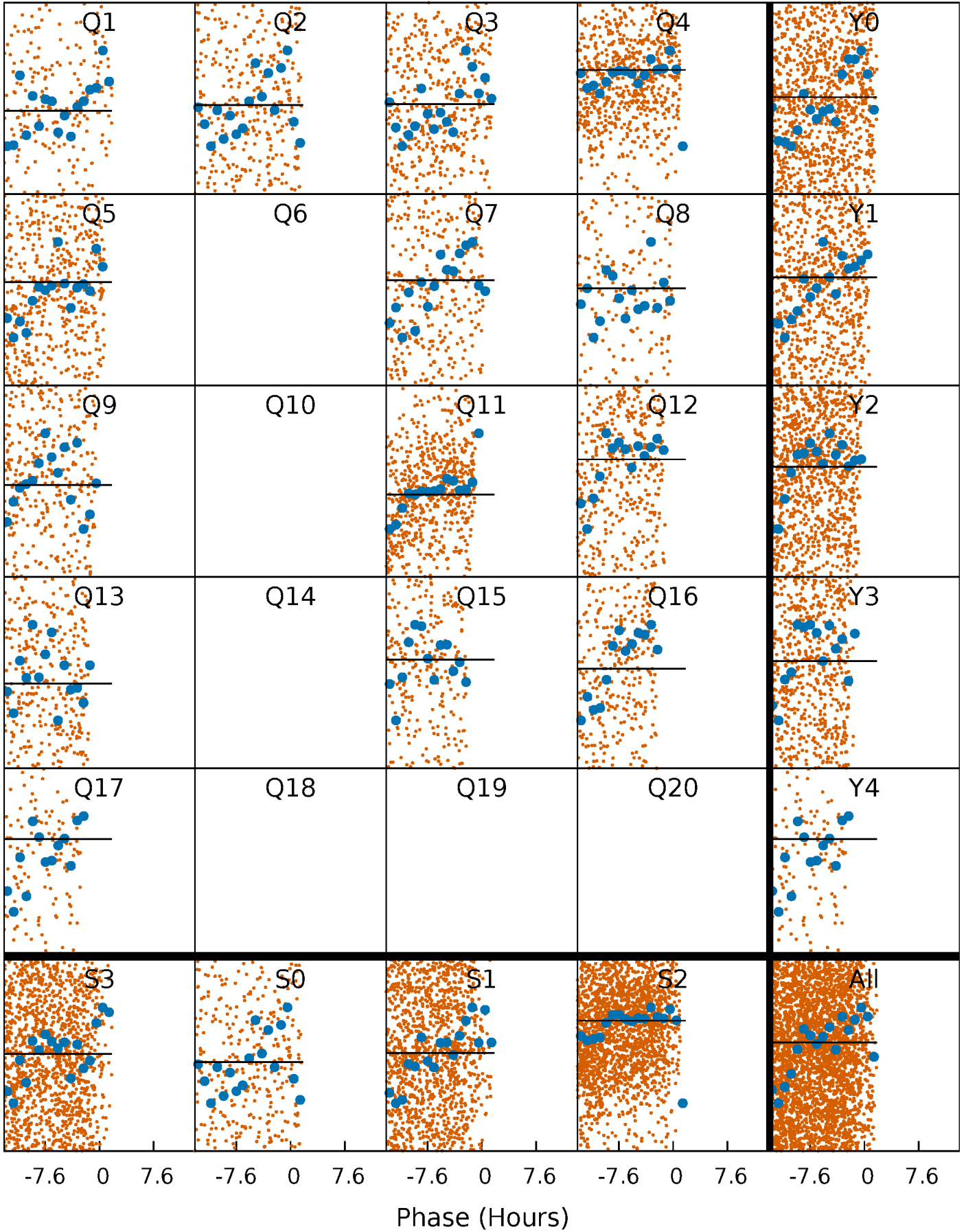
# PDC Quarter-Phased Transit Curves

TCE 003247616-02   P= 3.472358 Days    $T_0=134.876085$  (BKJD)



# DV Quarter-Phased Transit Curves

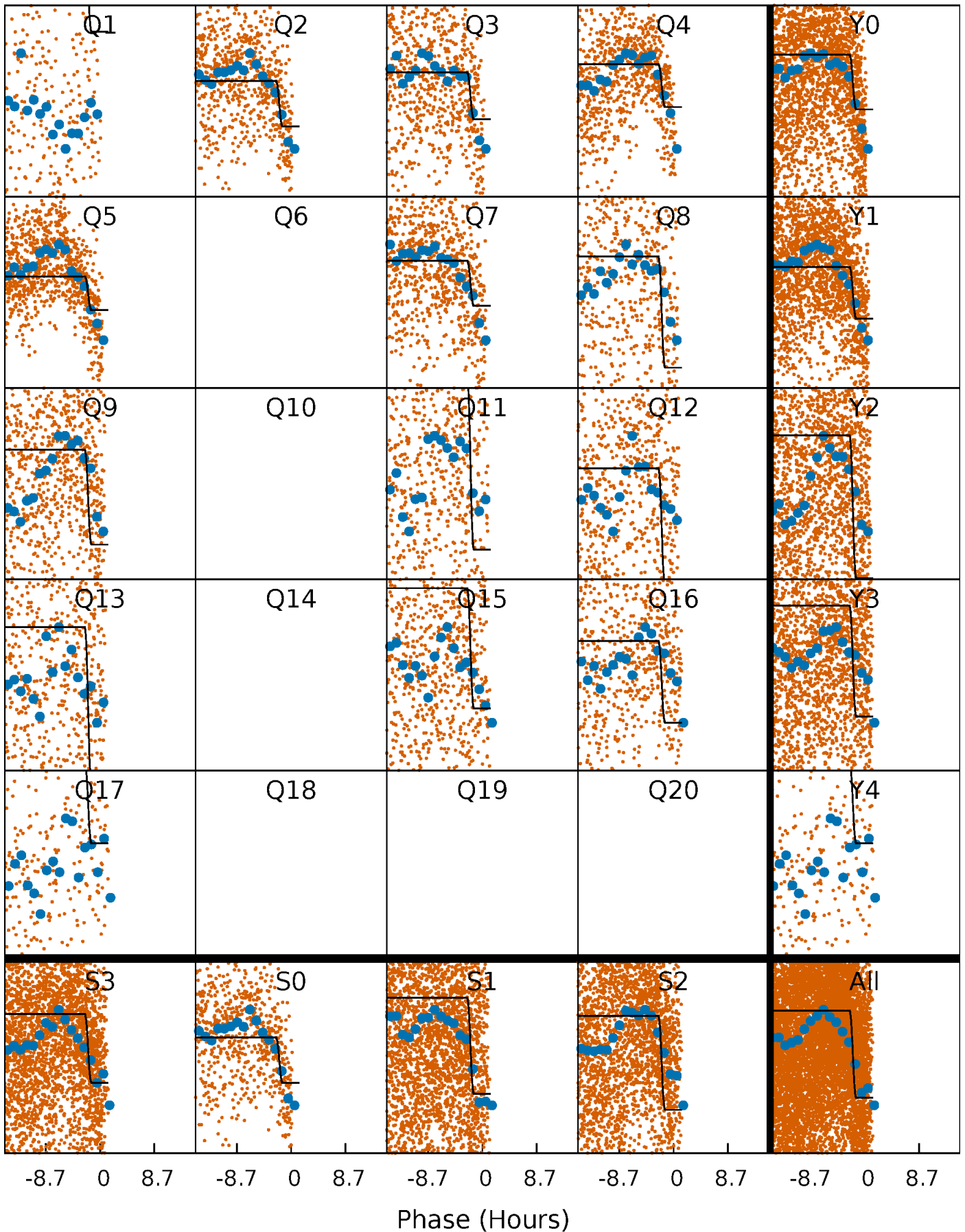
TCE 003247616-02   P= 3.472358 Days    $T_0=134.876085$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

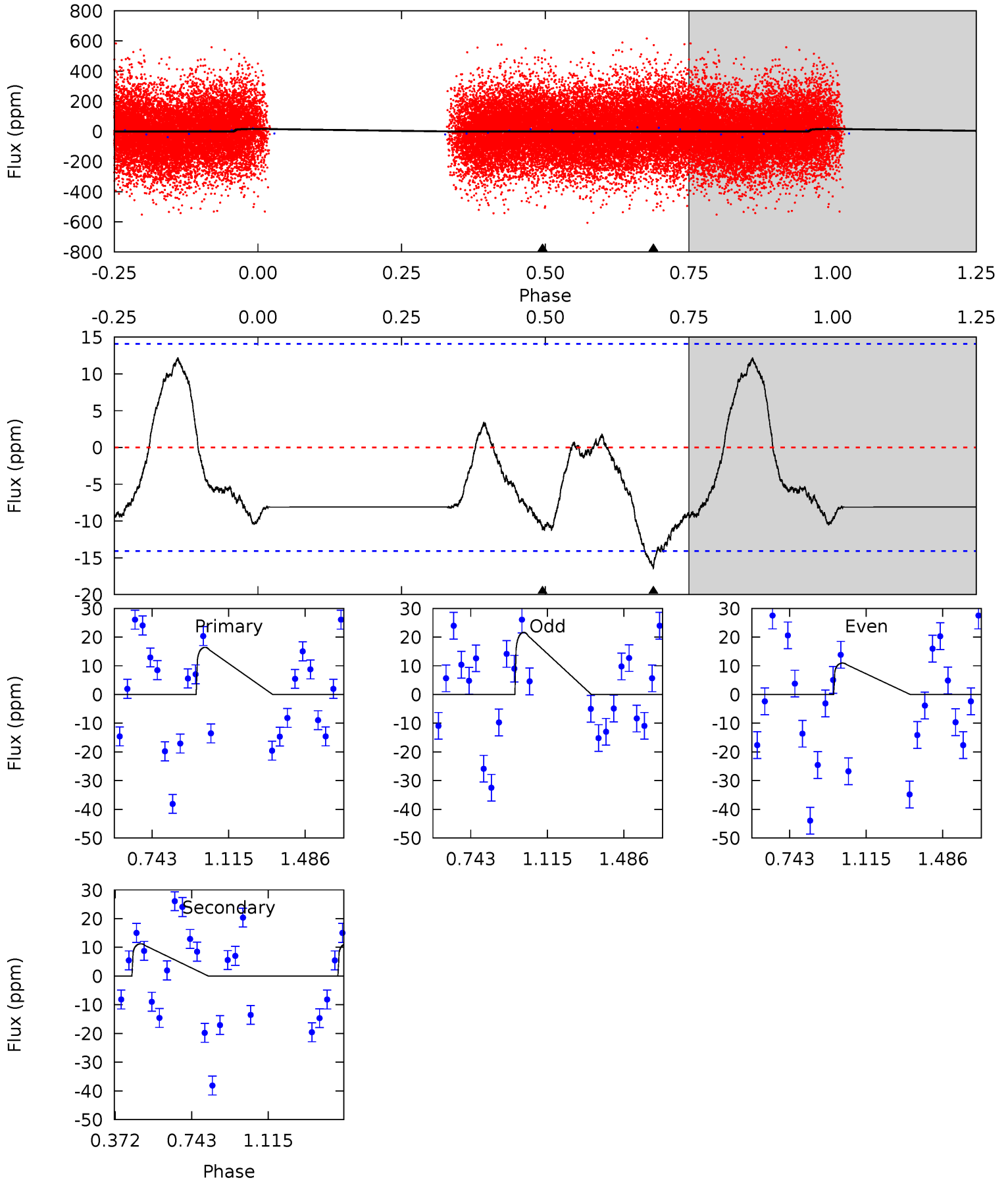
TCE 003247616-02   P= 3.471800 Days    $T_0=134.946518$  (BKJD)



# DV Model-Shift Uniqueness Test

003247616-02, P = 3.472358 Days, E = 131.403727 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.00	3.42	0	0	4.28	0.89	1.02	5.00	5.00	3.42	3.42	1.63	1.32	0.43	1.44

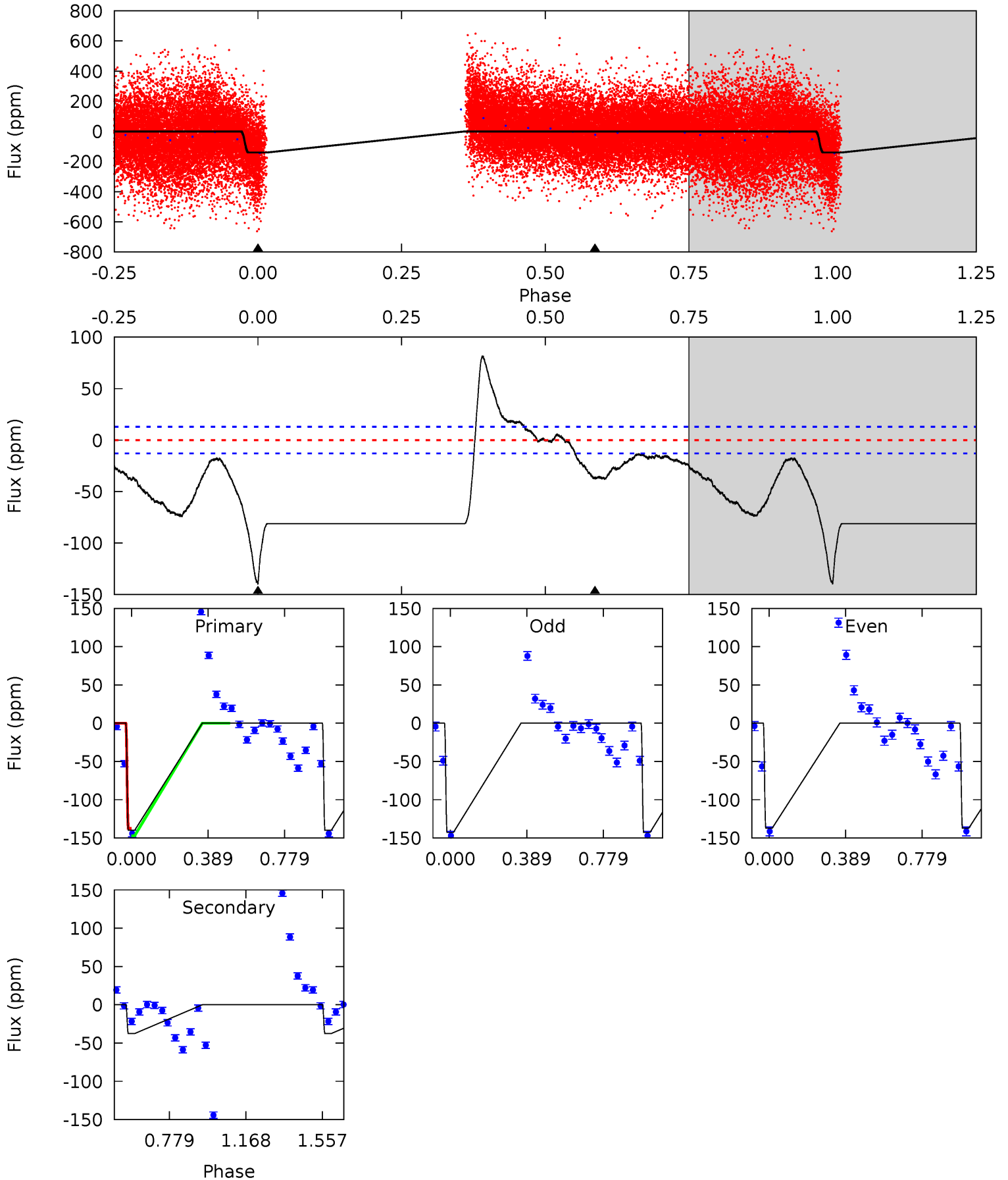




# Alt Model-Shift Uniqueness Test

003247616-02, P = 3.471800 Days, E = 131.474718 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
46.2	12.4	0	0	4.27	0.86	0.87	46.2	46.2	12.4	12.4	0.92	1.08	0.37	1.17



### Stellar Parameters For KIC 003247616

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$\rho_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6915^{+187}_{-229}$	$3.665^{+0.315}_{-0.074}$	$-0.220^{+0.300}_{-0.250}$	$3.127^{+0.390}_{-1.091}$	$1.651^{+0.208}_{-0.312}$	$0.076^{+0.155}_{-0.018}$
	+3%/-3%	+9%/-2%	+136%/-114%	+12%/-35%	+13%/-19%	+204%/-24%
Source	PHO1	FLK73	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 003247616-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-11 \pm 3$	$17.68^{+18.66}_{-12.52}$	$3178^{+536}_{-387}$	$-3015^{+6142}_{-383}$	$0.052^{+0.544}_{-0.042}$
Alt.	$-38 \pm 3$	$17.68^{+21.65}_{-12.07}$	$3186^{+537}_{-400}$	$-2773^{+6842}_{-545}$	$0.159^{+1.799}_{-0.126}$

$T_{\text{max}}$  = Theoretical Maximum Planetary Temperature  
 $T_{\text{obs}}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )  
 $A_{\text{obs}}$  = Observed Albedo (Assuming  $T=0$ )

If a secondary eclipse is present, the system is likely an EB if  $T_{\text{obs}} \gg T_{\text{max}}$  AND  $A_{\text{obs}} \gg 1.0$

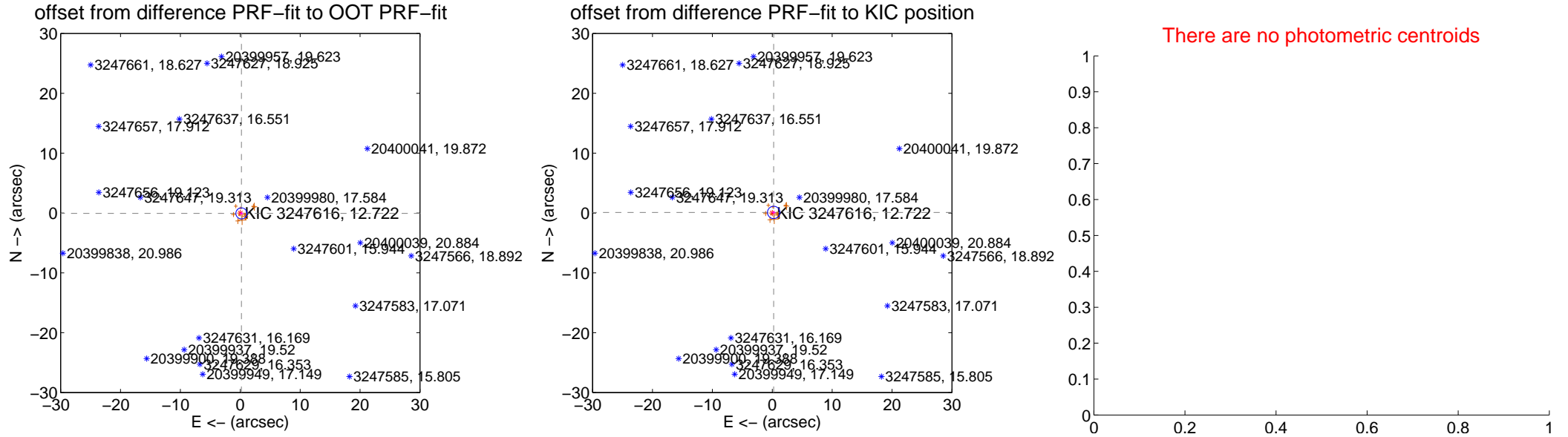
# DV Centroid Data

Supplemental centroid analysis for 003247616-02. Kepler magnitude: 12.72. Transit SNR 0.00

There are 0 quarters with good PRF difference image offsets

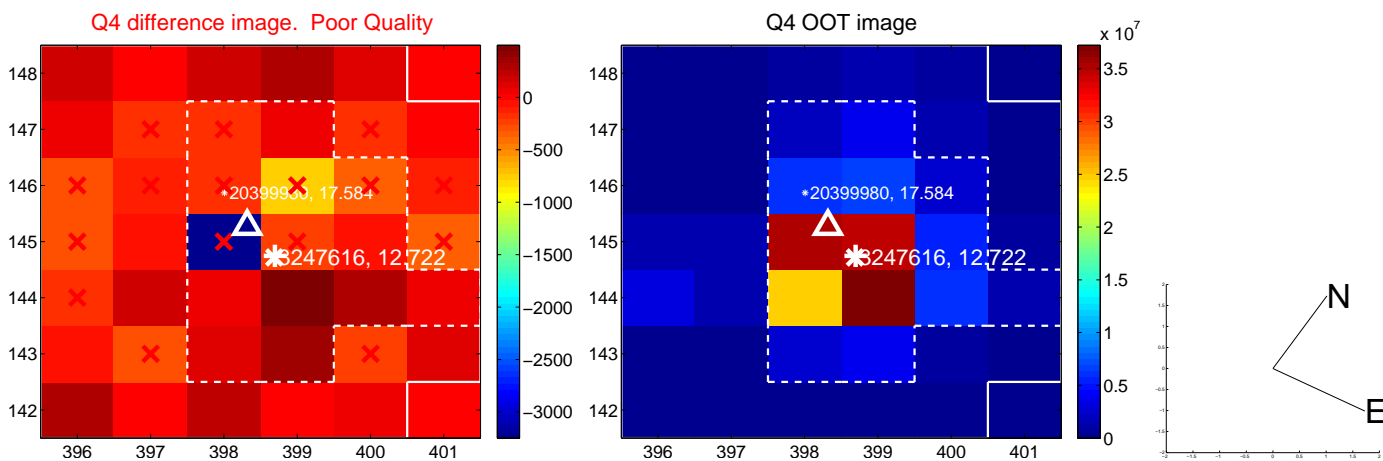
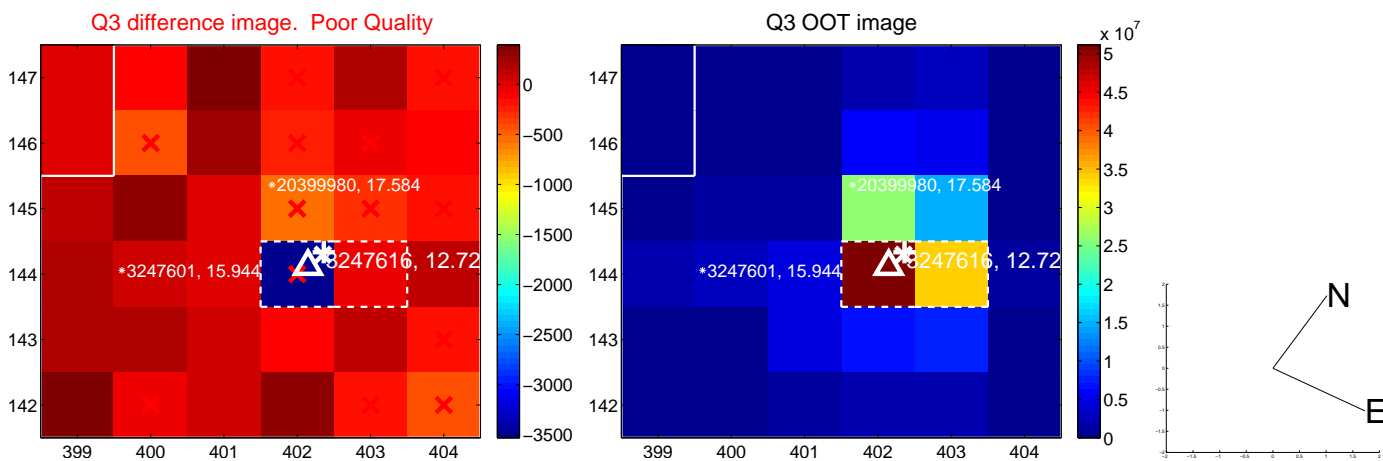
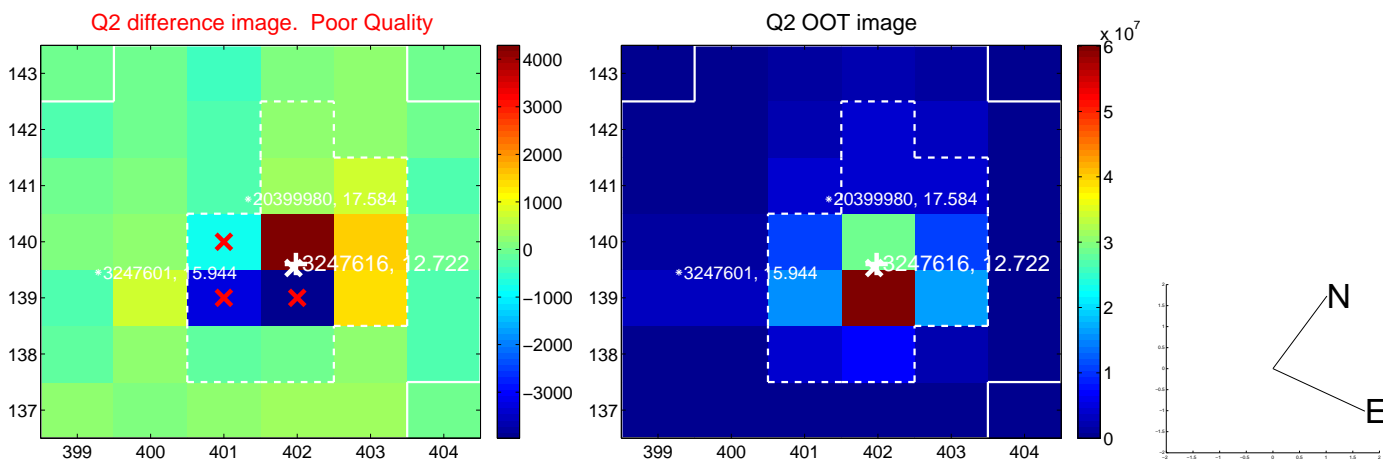
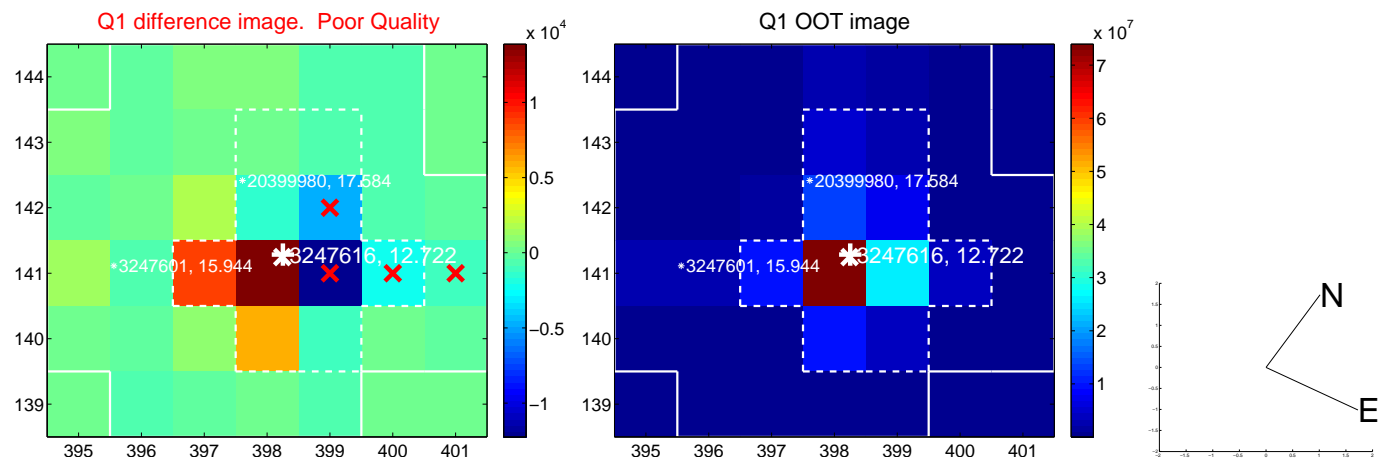
The direct PRF centroid is offset from the target star catalog position by about 0.22 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.197 \pm 0.307$	0.64	$-0.187 \pm 0.312$	$-0.061 \pm 0.257$
PRF-fit source offset from KIC position	$0.257 \pm 0.344$	0.75	$-0.238 \pm 0.318$	$0.098 \pm 0.274$
photometric centroid source offset	—	—	—	—

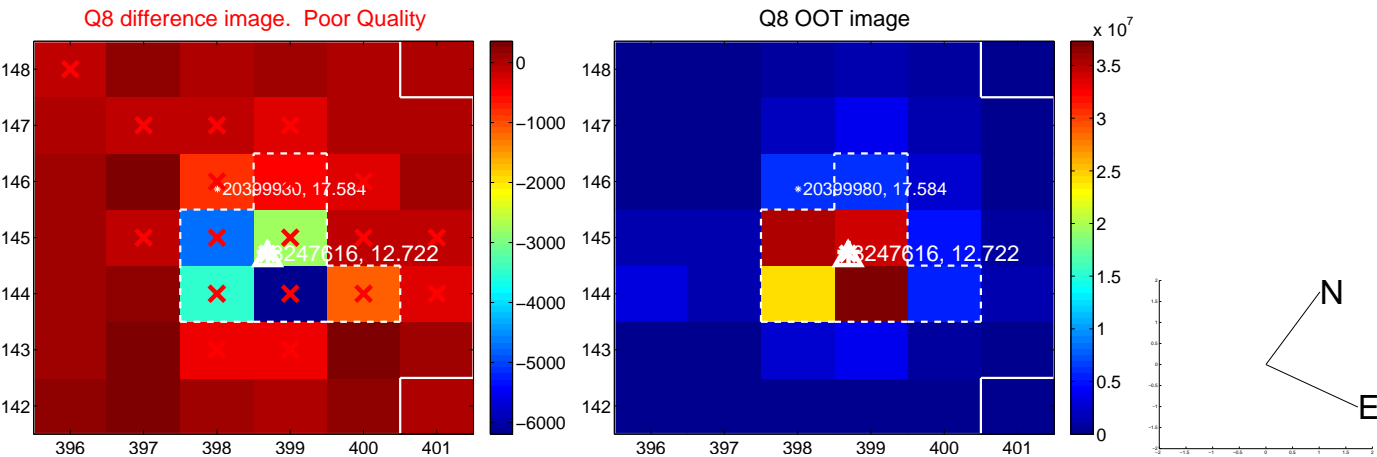
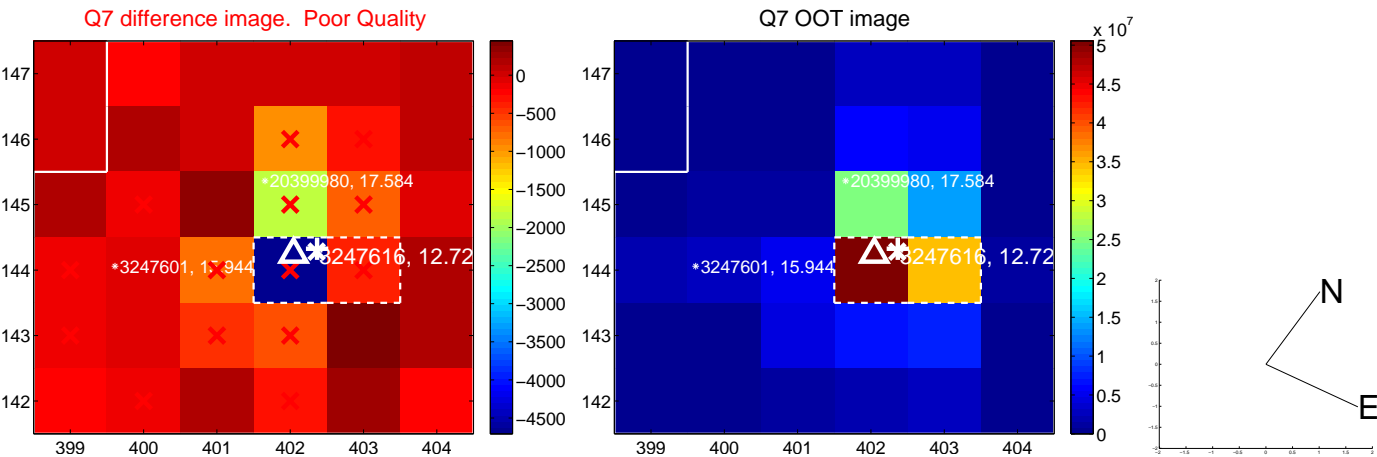
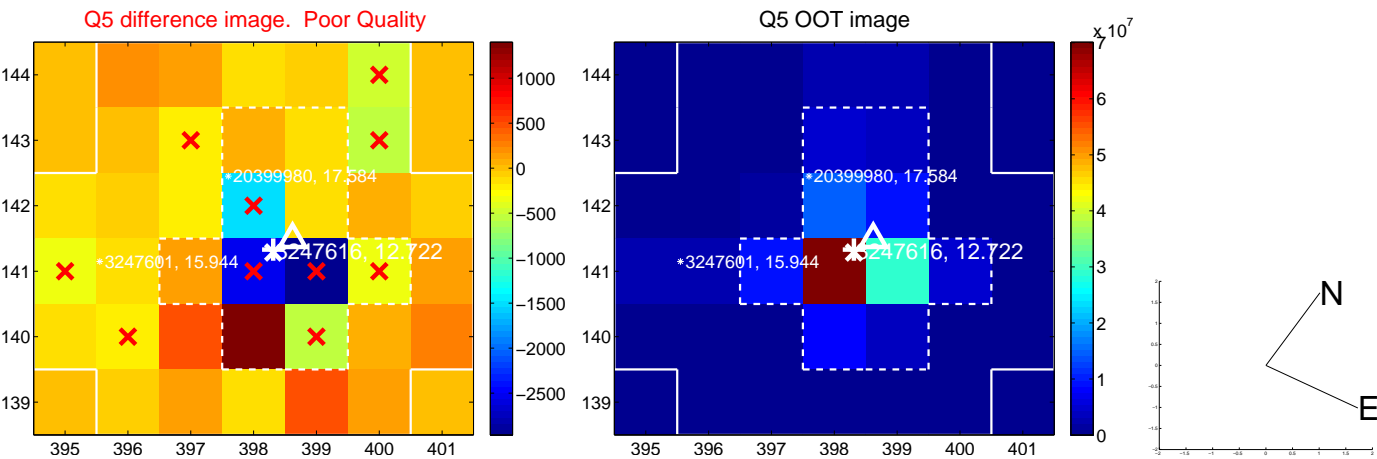


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

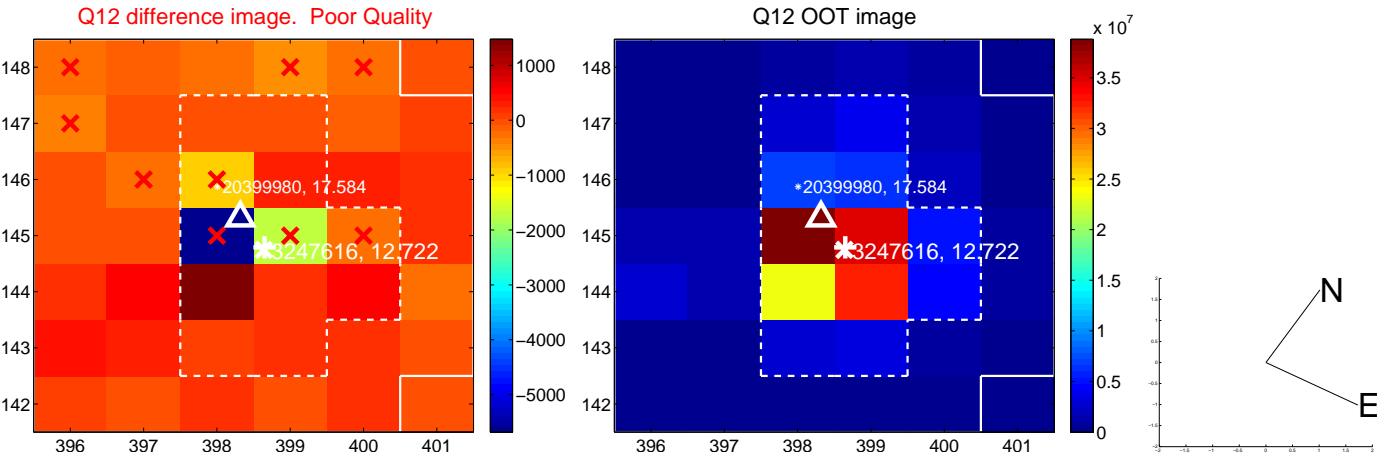
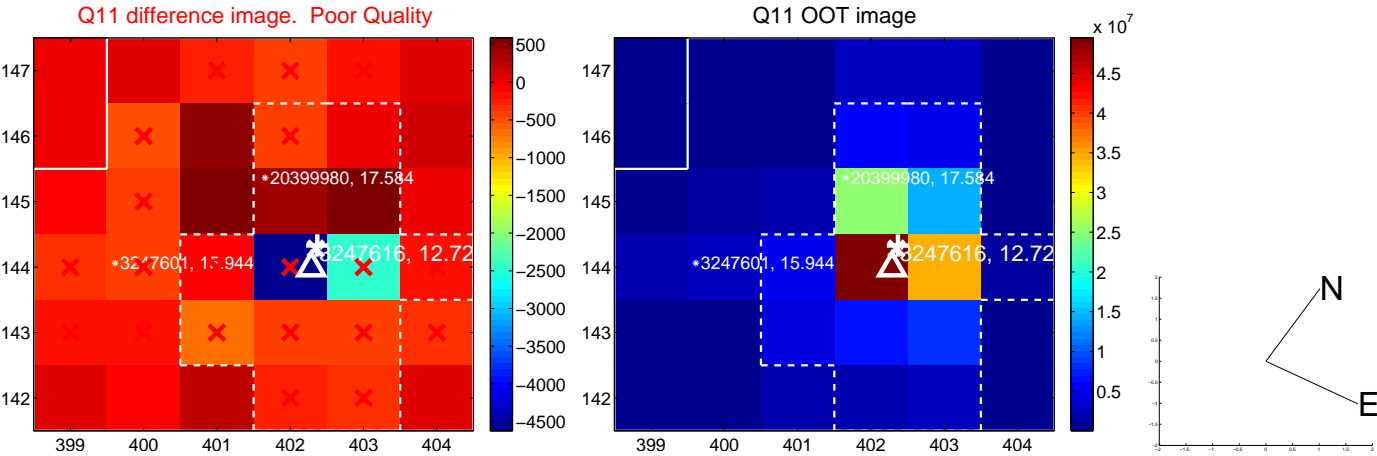
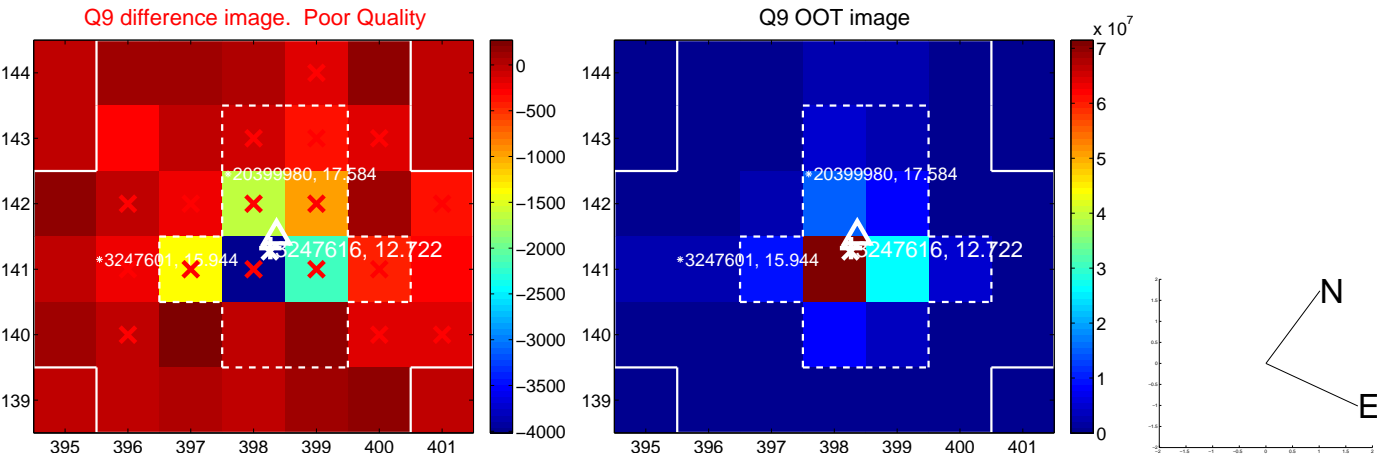


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

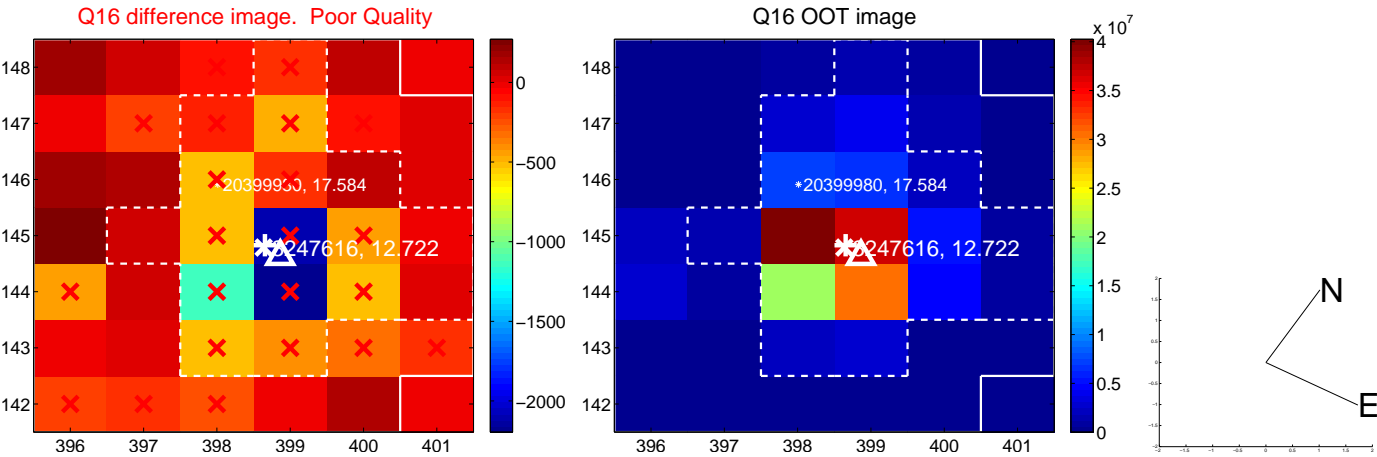
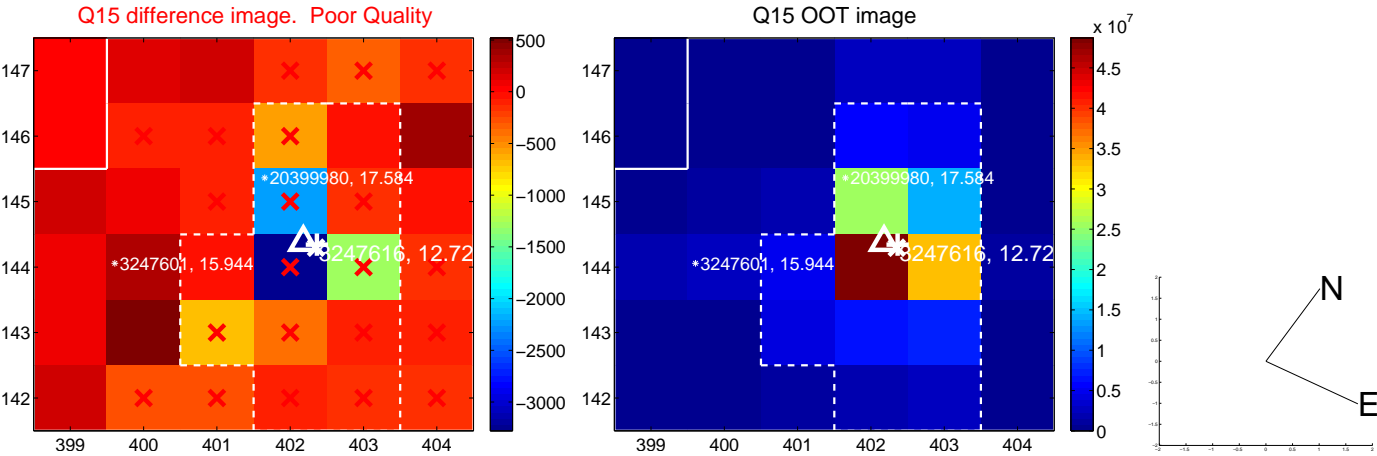
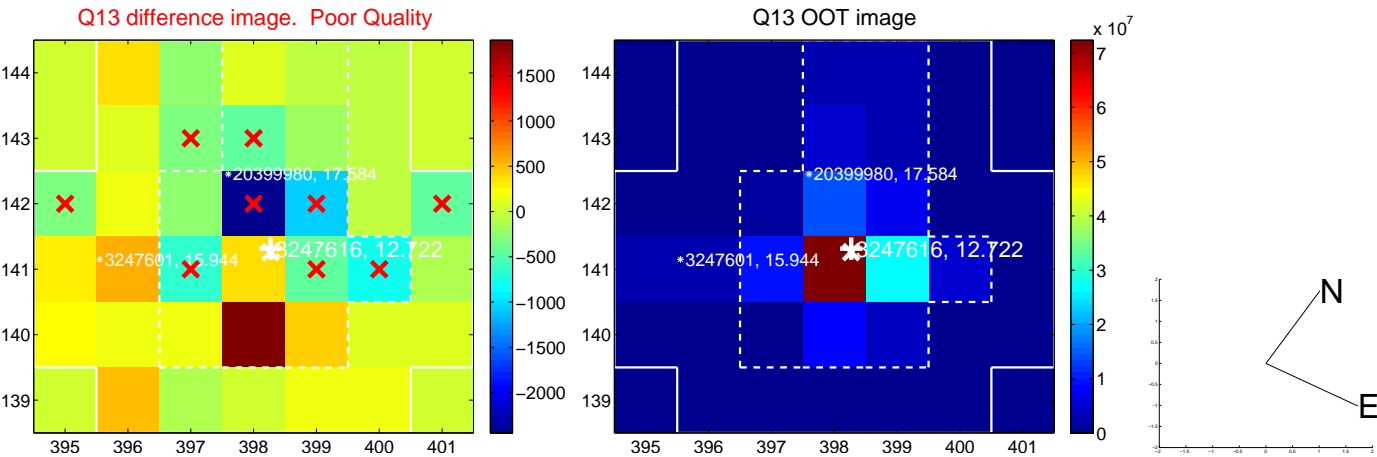




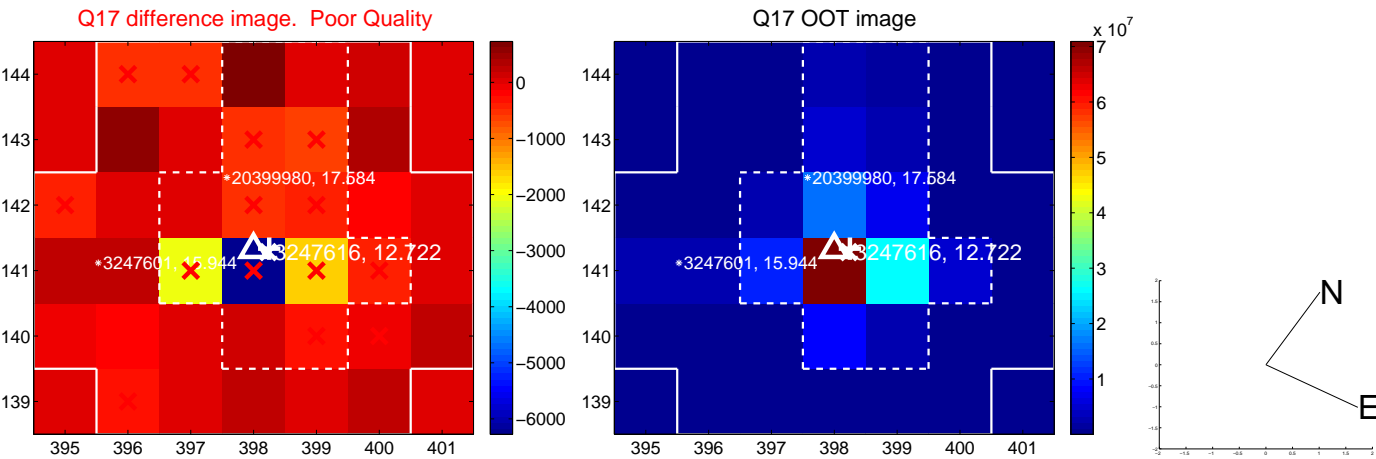
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



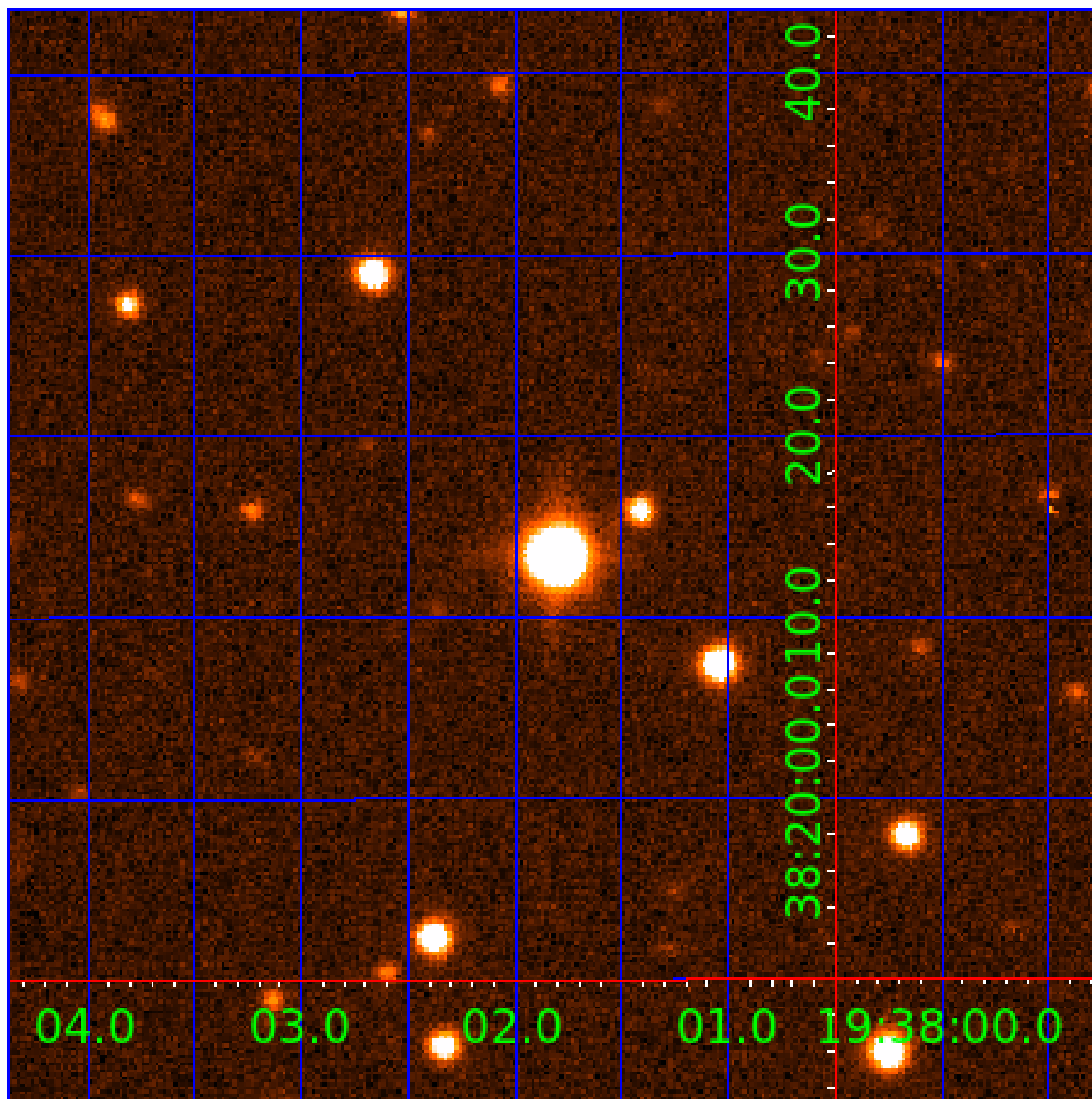
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



folded centroid time series figure for this object.

UKIRT Image

Declination



# KIC 003247616

## Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	$R_{\star}$ ( $R_{\odot}$ )	$T_{\star}$ (K)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003247616-01	OBS	No	3.471928	132.100191	70.7	9.800	12.2	14.5	3.13	6915	4.99	7123.95
003247616-02	OBS	No	3.472358	134.876085	0.0	6.691	10.0	0.0	3.13	6915	0.01	7122.77
003247616-03	OBS	No	3.471931	134.373317	32.8	8.764	8.9	9.3	3.13	6915	2.22	7123.94
003247616-04	OBS	No	289.107157	379.348536	246.4	21.063	11.6	7.5	3.13	6915	5.82	19.59
003247616-05	OBS	No	126.523774	180.521913	349.7	3.437	8.5	9.1	3.13	6915	6.71	58.96
003247616-06	OBS	No	81.171074	206.811883	195.3	4.351	7.5	7.3	3.13	6915	4.94	106.56
003247616-07	OBS	No	148.796891	198.768348	291.8	4.044	7.3	7.9	3.13	6915	7.04	47.50

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003247616-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV
003247616-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—SWEET_NTL—LPP_DV—SAME_NTL_PERIOD—CENT_FEW_DIFFS
003247616-03	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—SAME_NTL_PERIOD
003247616-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
003247616-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT
003247616-06	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
003247616-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

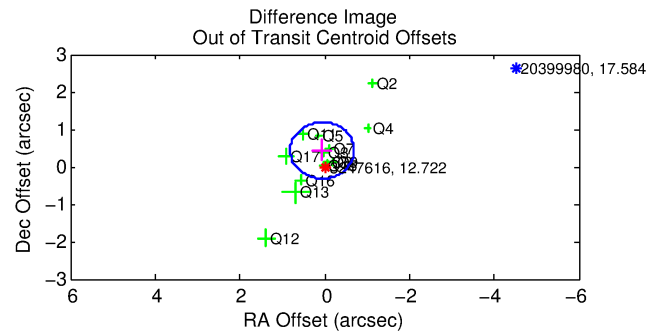
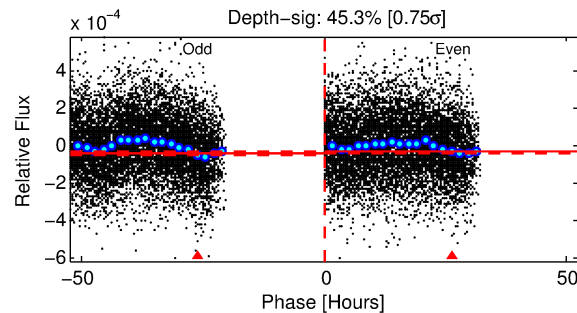
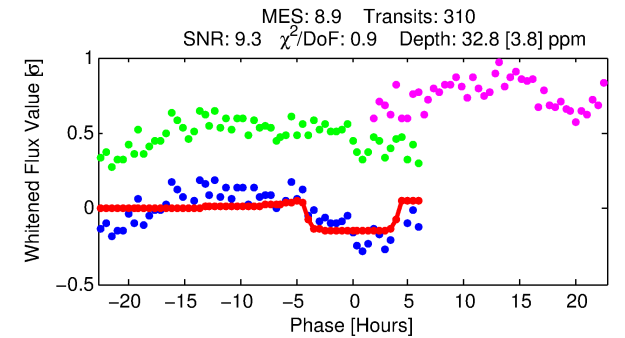
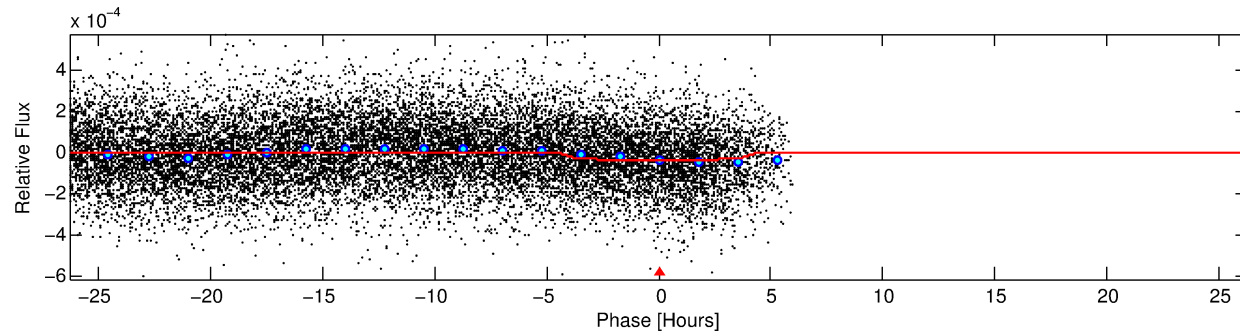
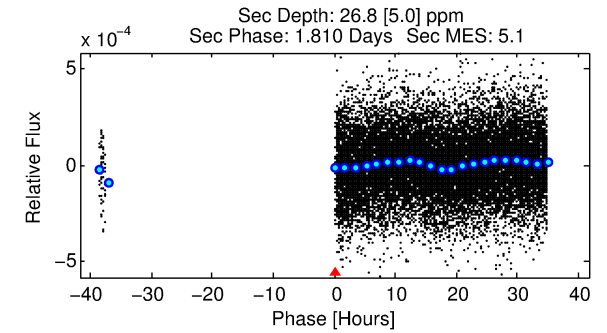
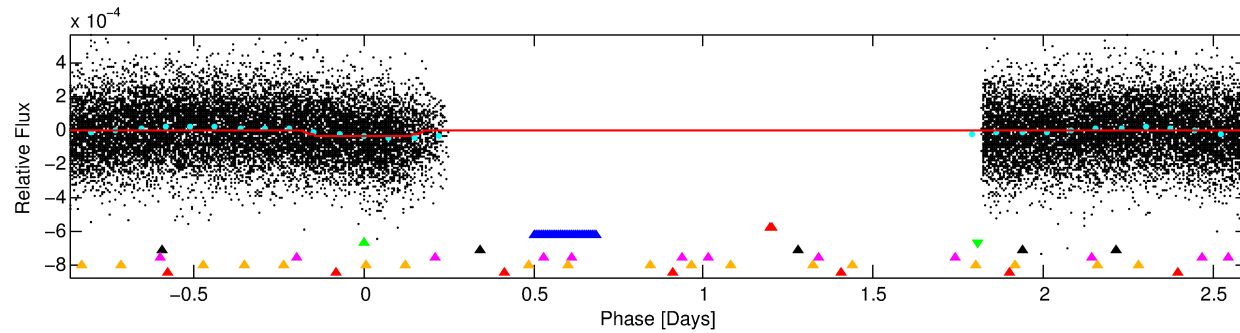
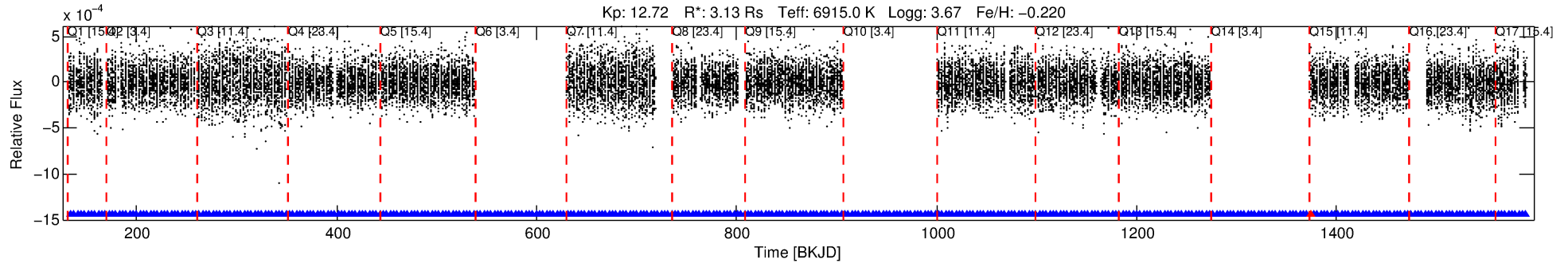
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 003247616-03

No Significant Match Found

# DV One-Page Summary

KIC: 3247616 Candidate: 3 of 7 Period: 3.472 d



## DV Fit Results:

Period = 3.47193 [0.00005] d  
Epoch = 134.3733 [0.0100] BKJD  
Rp/R\* = 0.0065 [0.0008]  
a/R\* = 1.35 [0.40]  
b = 0.96 [0.06]  
Seff = 7123.94 [3937.31]  
Teq = 2343 [324] K  
Rp = 2.22 [0.82] Re  
a = 0.0530 [0.0178] AU  
Ag = 8.43 [5.17] [1.44σ]  
Teffp = 6171 [502] K [6.41σ]

## DV Diagnostic Results:

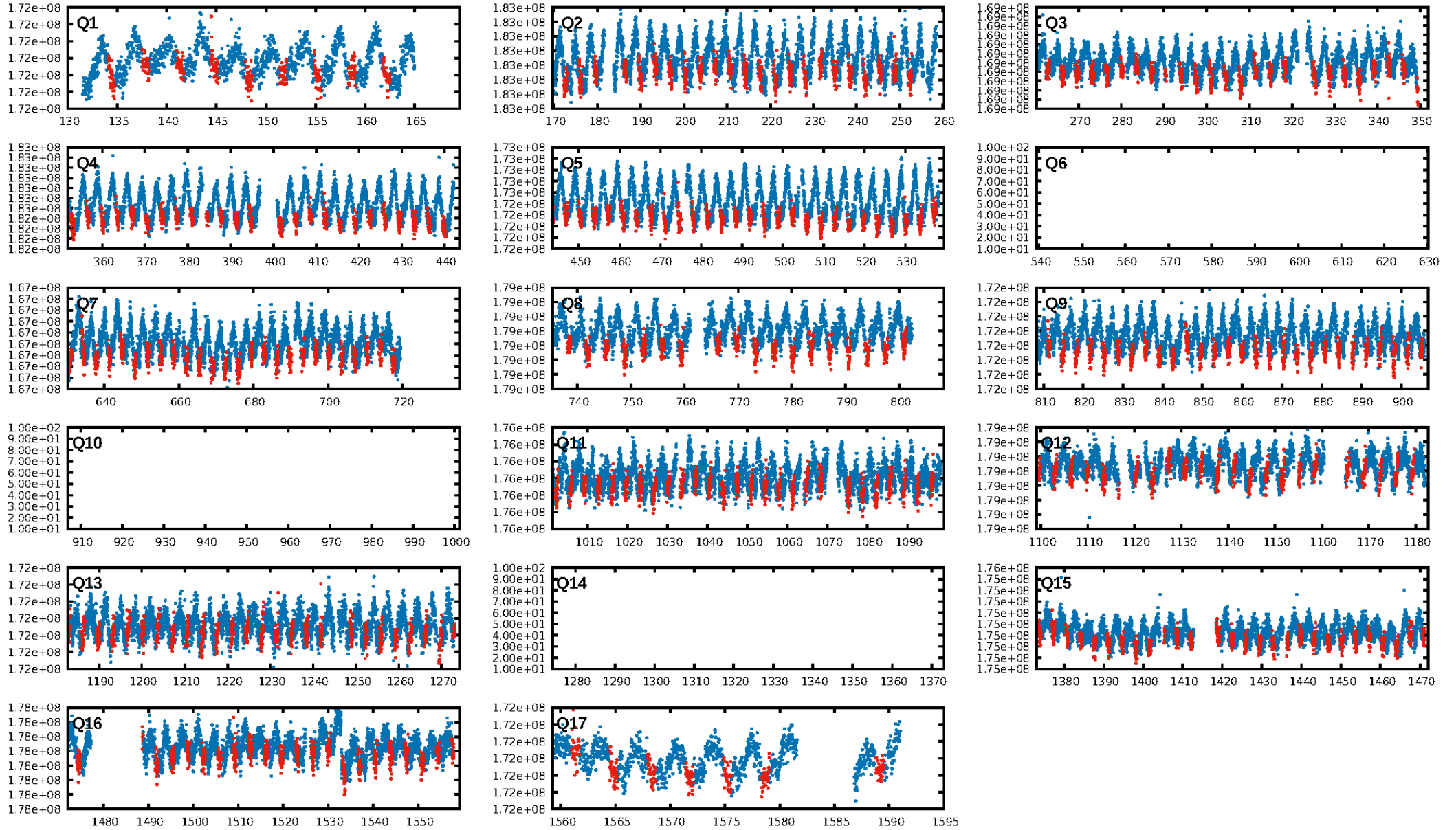
ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: 0.1% [0.00σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 3.13e-11  
RollingBand-fgt: 1.00 [293/294]  
GhostDiagnostic-chr: 1.511  
Centroid-sig: 52.3%  
Centroid-so: 0.392 arcsec [0.46σ]  
OotOffset-rm: 0.436 arcsec [1.74σ]  
OotOffset-st: 1/4/4/4 [13]  
KicOffset-rm: 0.585 arcsec [2.05σ]  
KicOffset-st: 1/4/4/4 [13]  
DiffImageQuality-fgm: 1.00 [13/13]  
DiffImageOverlap-fno: 0.00 [0/14]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 13:10:10 Z

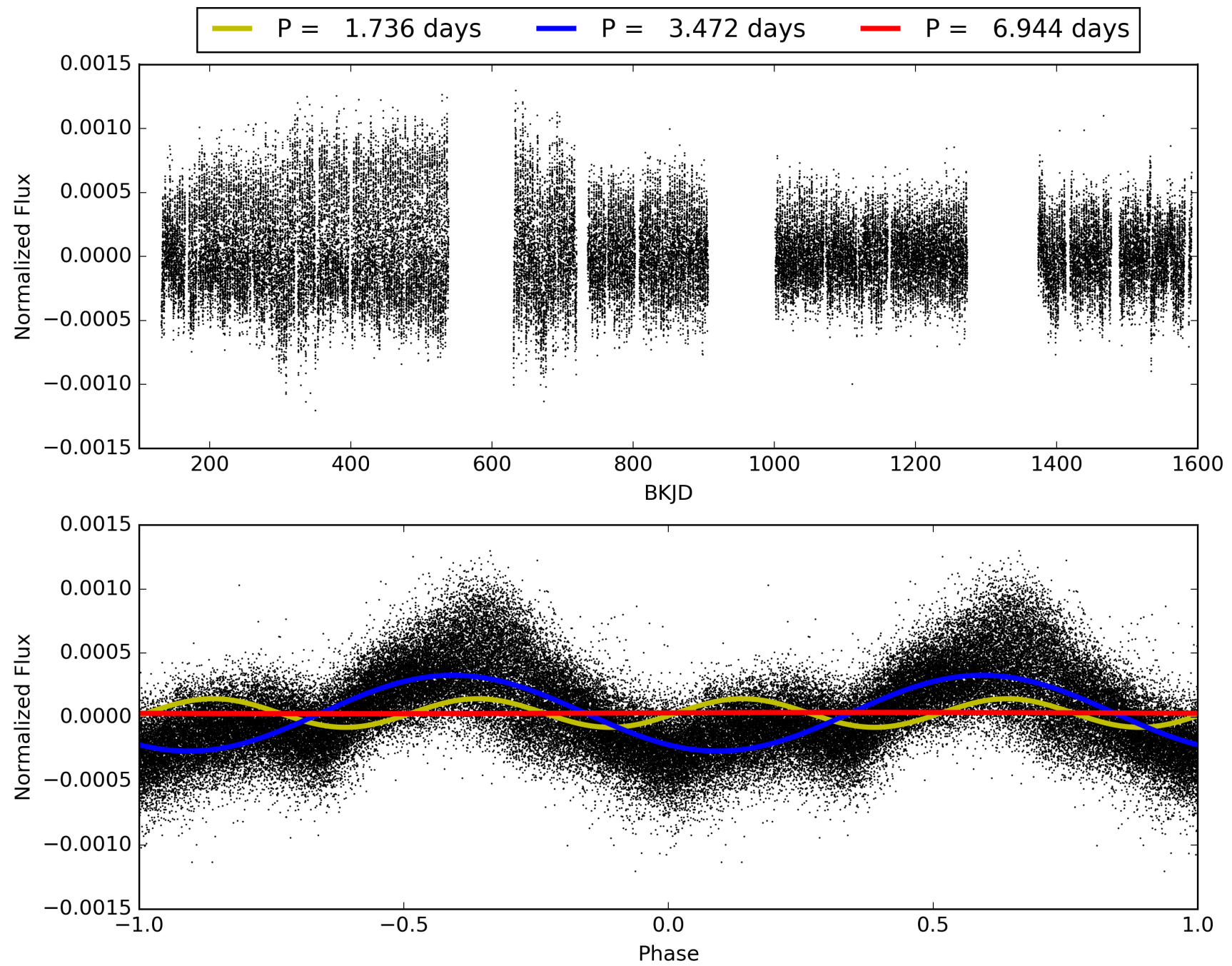
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 003247616-03, PDC Light Curves

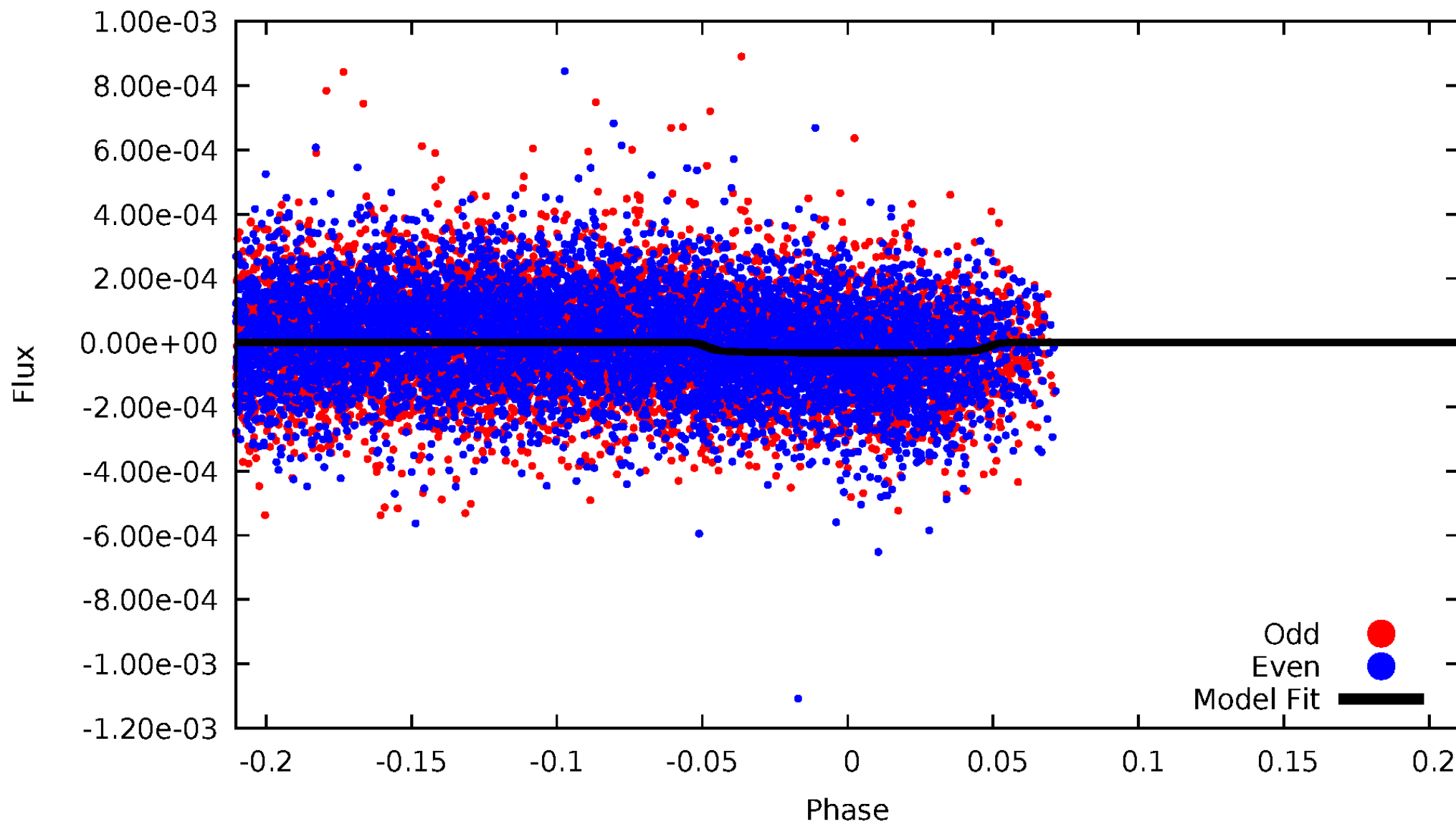


TCE 003247616-03



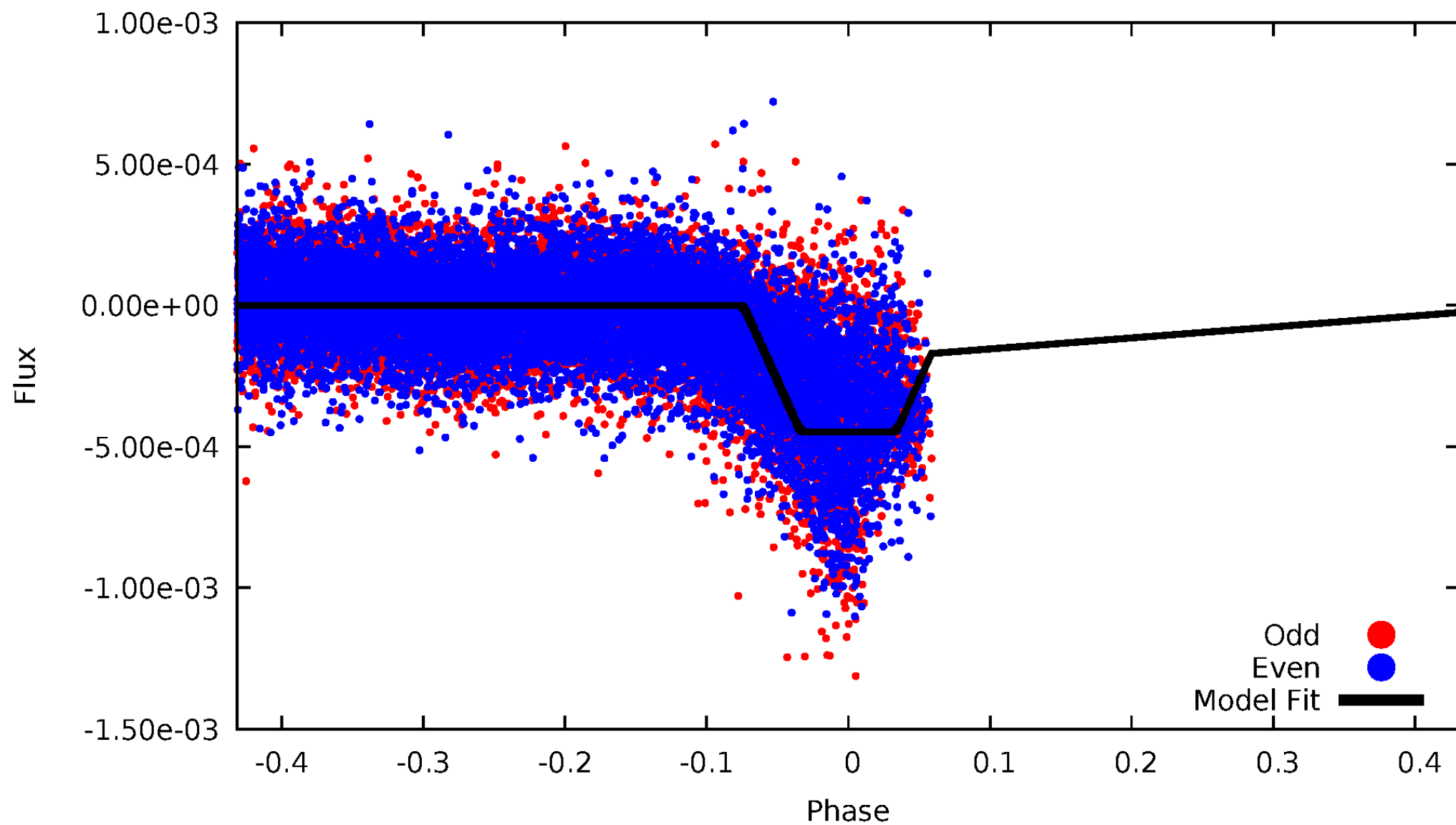
DV Odd/Even

TCE 003247616-03

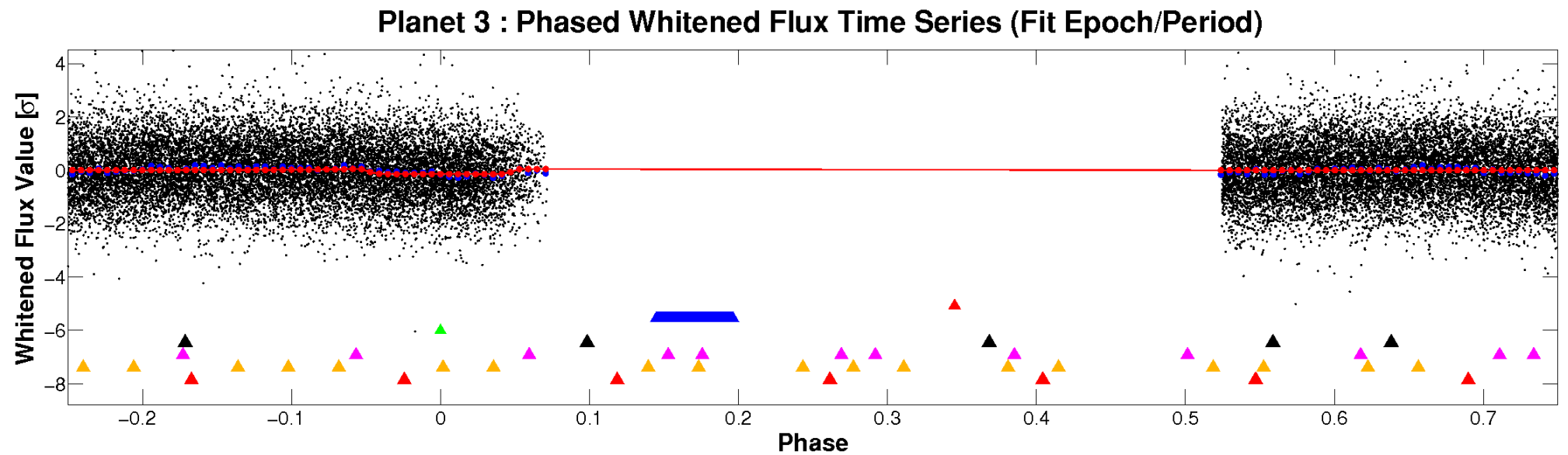
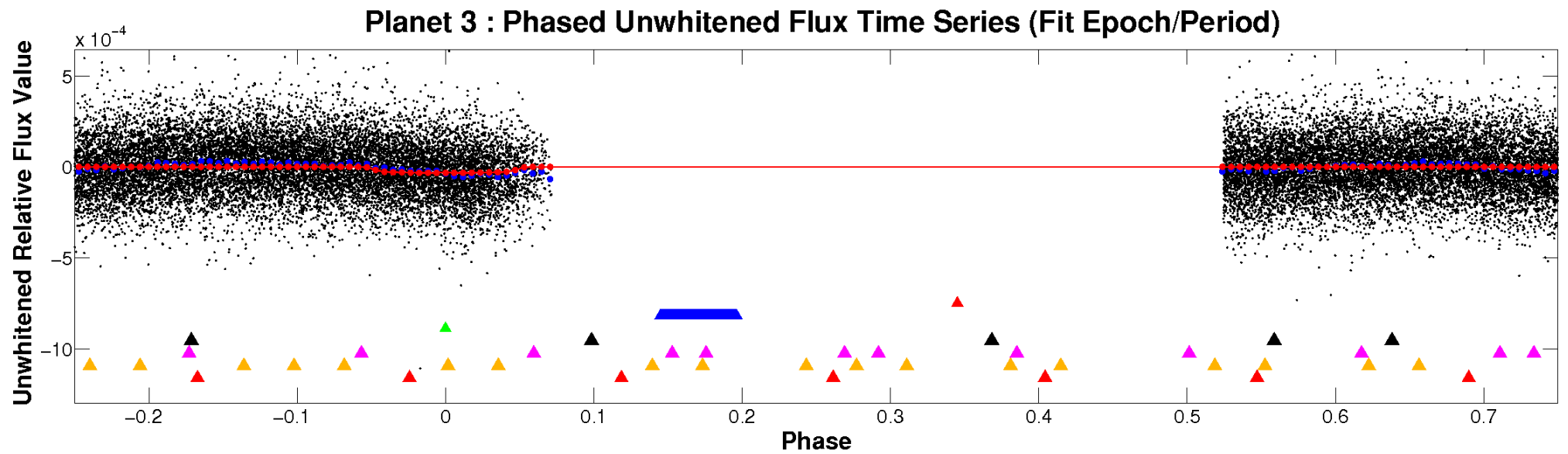


# ALT Odd/Even

TCE 003247616-03



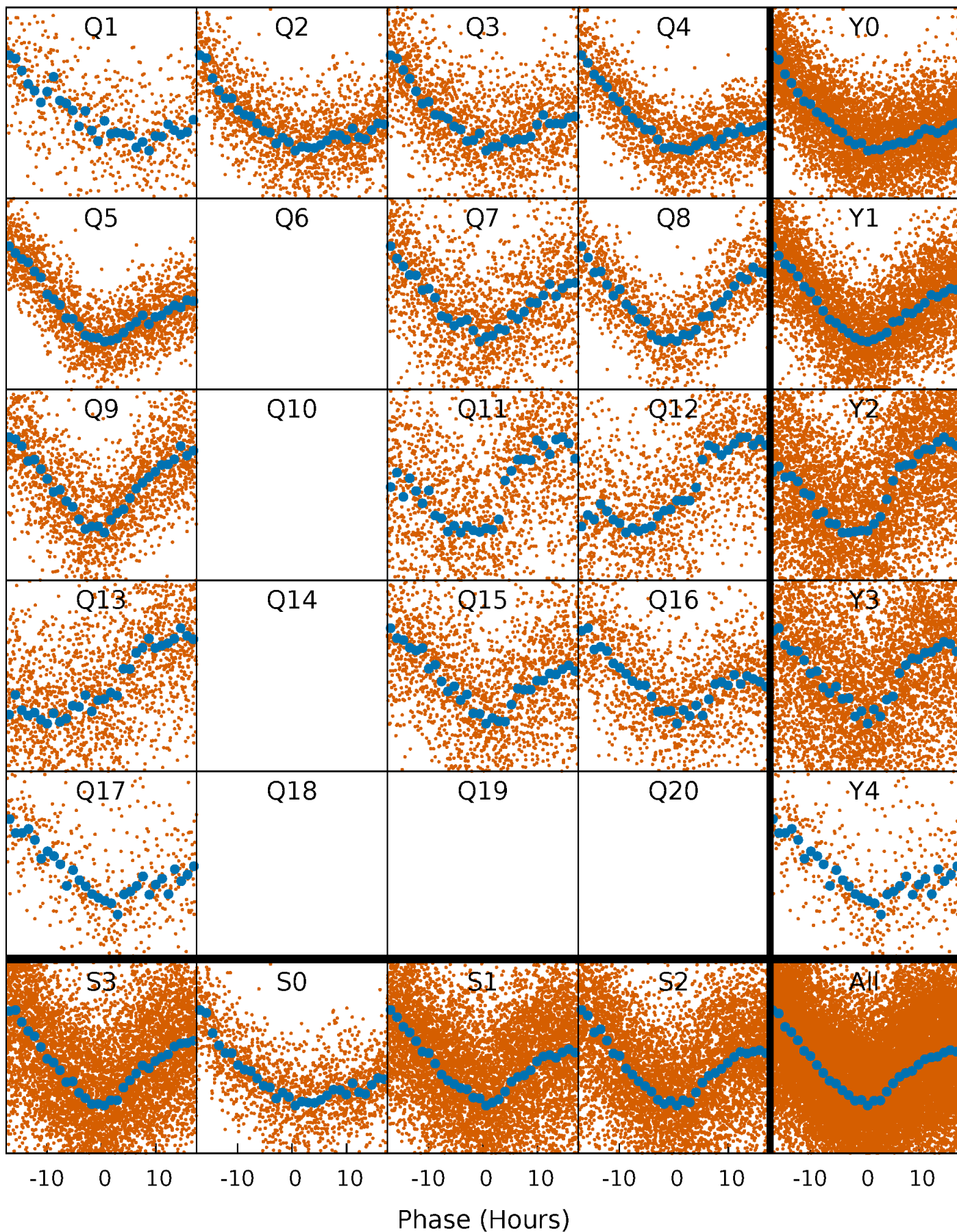
# Non-Whitened Vs. Whitened Light Curve





# PDC Quarter-Phased Transit Curves

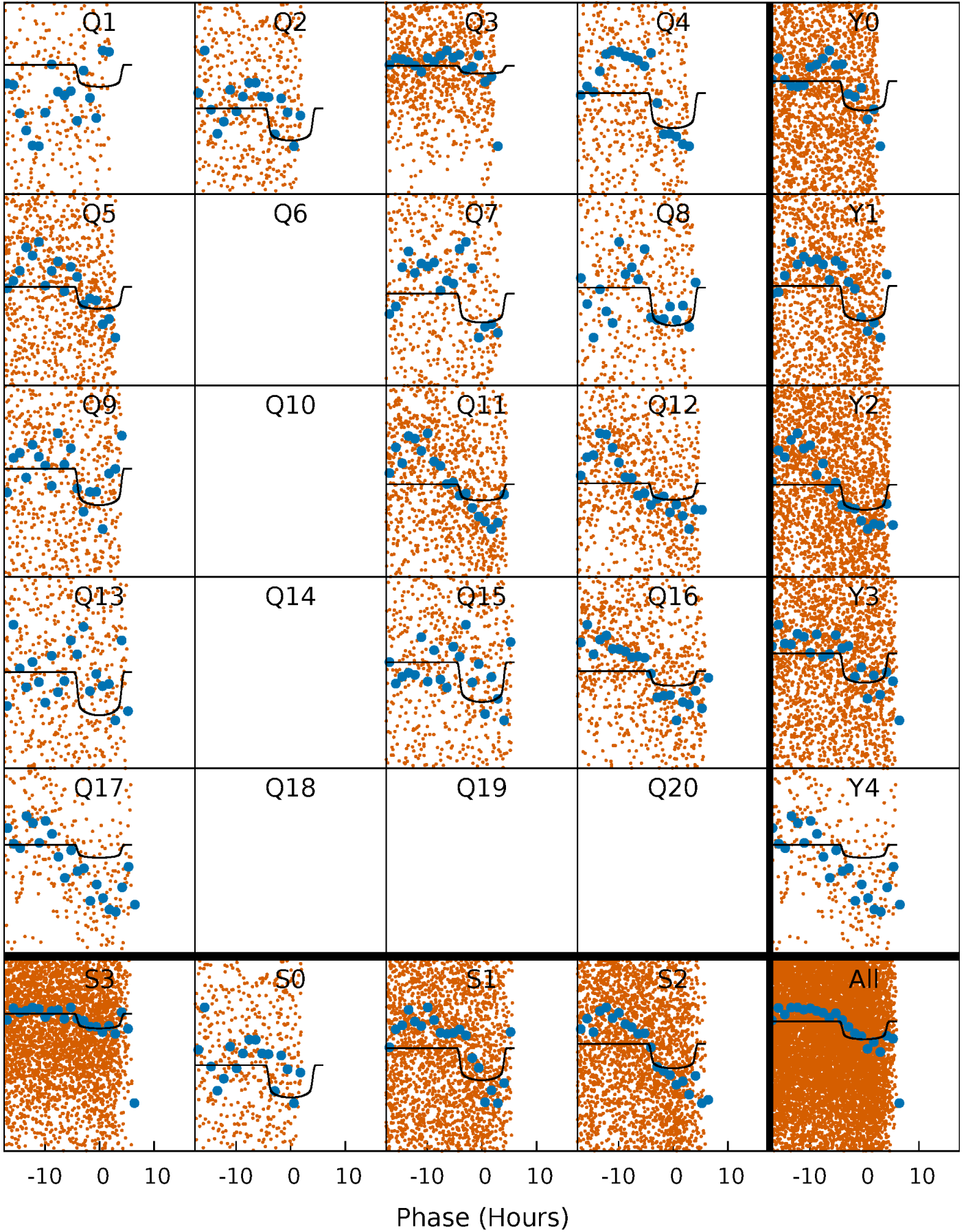
TCE 003247616-03   P= 3.471931 Days    $T_0=134.373317$  (BKJD)





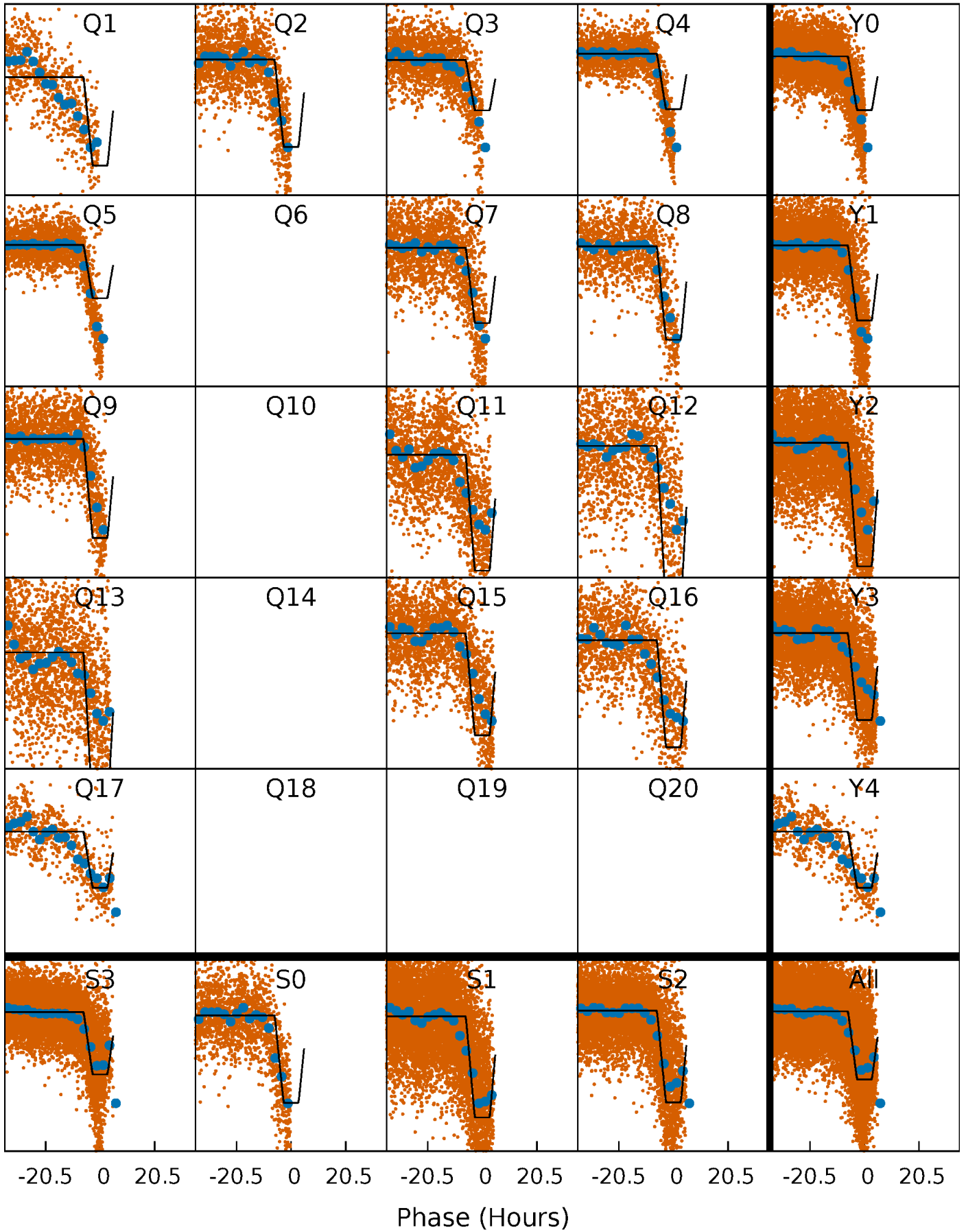
# DV Quarter-Phased Transit Curves

TCE 003247616-03   P= 3.471931 Days    $T_0=134.373317$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

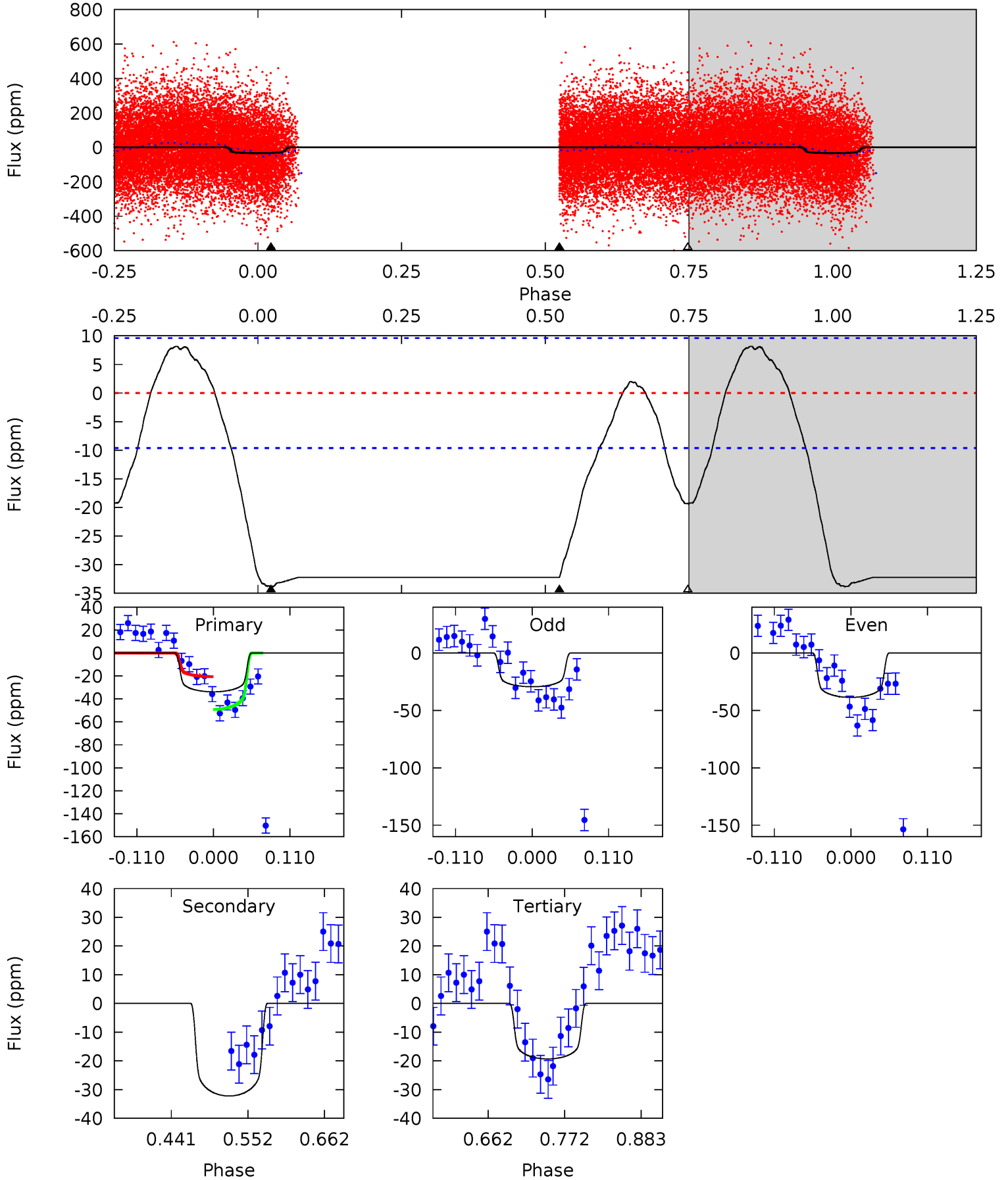
TCE 003247616-03     $P = 3.471800$  Days     $T_0 = 134.471948$  (BKJD)



# DV Model-Shift Uniqueness Test

003247616-03, P = 3.471931 Days, E = 130.901386 Days

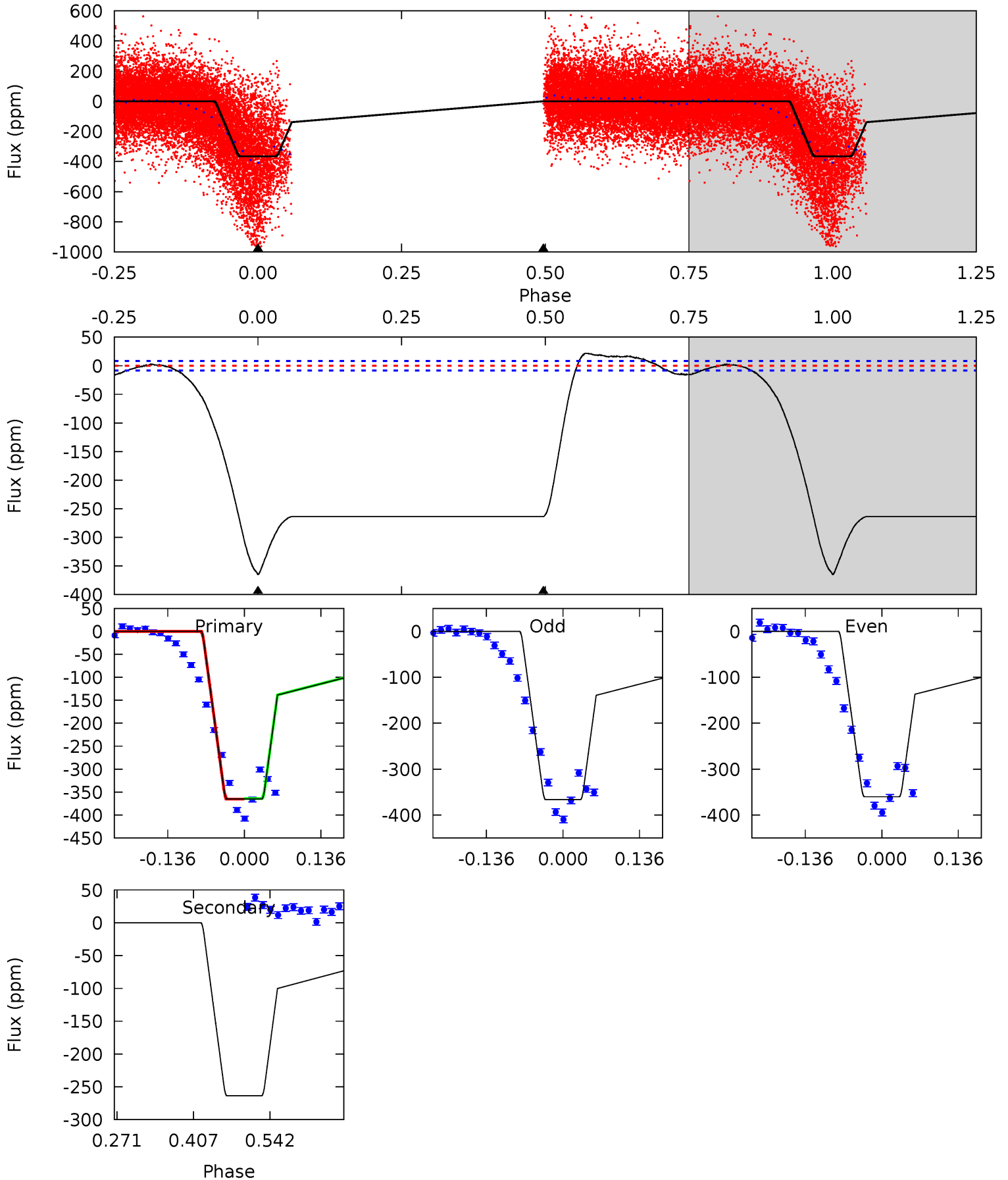
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.0	15.2	9.13	0	4.54	1.60	4.35	6.85	16.0	6.10	15.2	2.20	1.03	0.19	7.24



# Alt Model-Shift Uniqueness Test

003247616-03, P = 3.471800 Days, E = 131.000148 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
199.3	143.9	0	0	4.50	1.49	5.79	199.3	199.3	143.9	143.9	1.76	1.02	0.06	0.16



### Stellar Parameters For KIC 003247616

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6915^{+187}_{-229}$	$3.665^{+0.315}_{-0.074}$	$-0.220^{+0.300}_{-0.250}$	$3.127^{+0.390}_{-1.091}$	$1.651^{+0.208}_{-0.312}$	$0.076^{+0.155}_{-0.018}$
	+3%/-3%	+9%/-2%	+136%/-114%	+12%/-35%	+13%/-19%	+204%/-24%
Source	PHO1	FLK73	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 003247616-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-32 \pm 2$	$2.13^{+0.39}_{-0.44}$	$3204^{+175}_{-275}$	$6387^{+490}_{-417}$	$11^{+6}_{-3}$
Alt.	$-264 \pm 2$	$6.98^{+0.81}_{-1.25}$	$3188^{+171}_{-259}$	$5962^{+192}_{-196}$	$8.461^{+3.222}_{-1.459}$

$T_{\text{max}}$  = Theoretical Maximum Planetary Temperature

$T_{\text{obs}}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )

$A_{\text{obs}}$  = Observed Albedo (Assuming  $T=0$ )

If a secondary eclipse is present, the system is likely an EB if  $T_{\text{obs}} \gg T_{\text{max}}$  AND  $A_{\text{obs}} \gg 1.0$

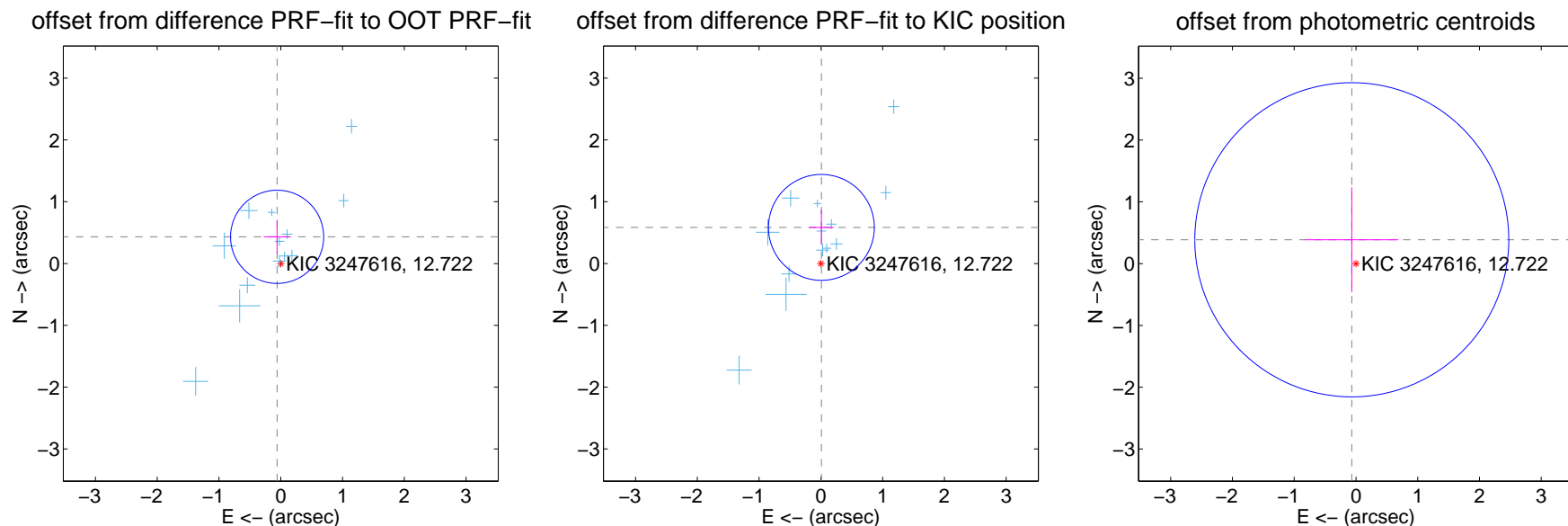
## DV Centroid Data

Supplemental centroid analysis for 003247616-03. Kepler magnitude: 12.72. Transit SNR 9.32

There are 13 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.23 arcsec

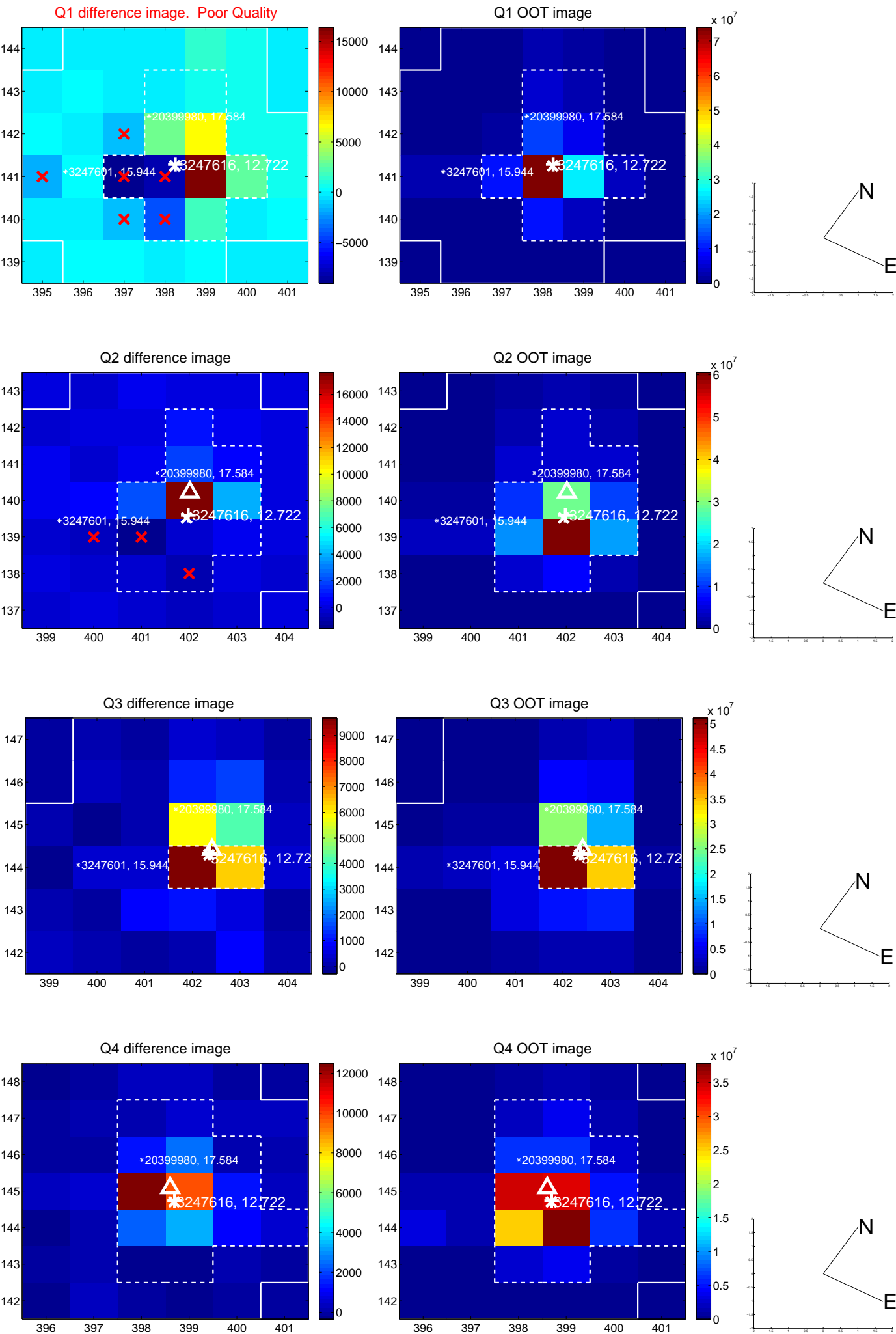
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.436 \pm 0.251$	1.74	$0.059 \pm 0.217$	$0.432 \pm 0.276$
PRF-fit source offset from KIC position	$0.585 \pm 0.286$	2.05	$-0.009 \pm 0.203$	$0.585 \pm 0.283$
photometric centroid source offset	$0.39 \pm 0.85$	0.46	$0.07 \pm 0.76$	$0.39 \pm 0.85$



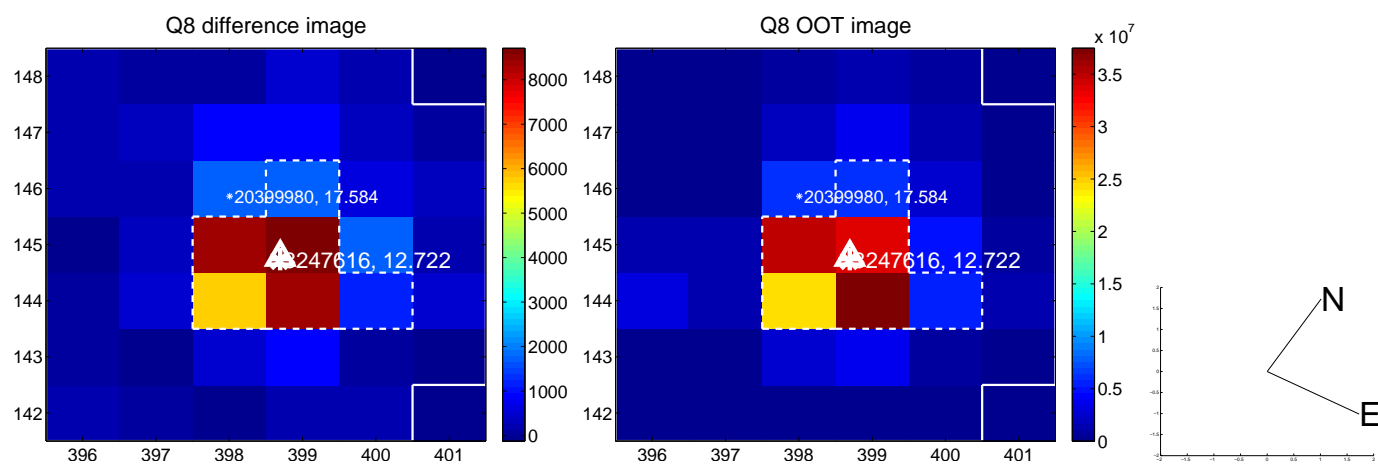
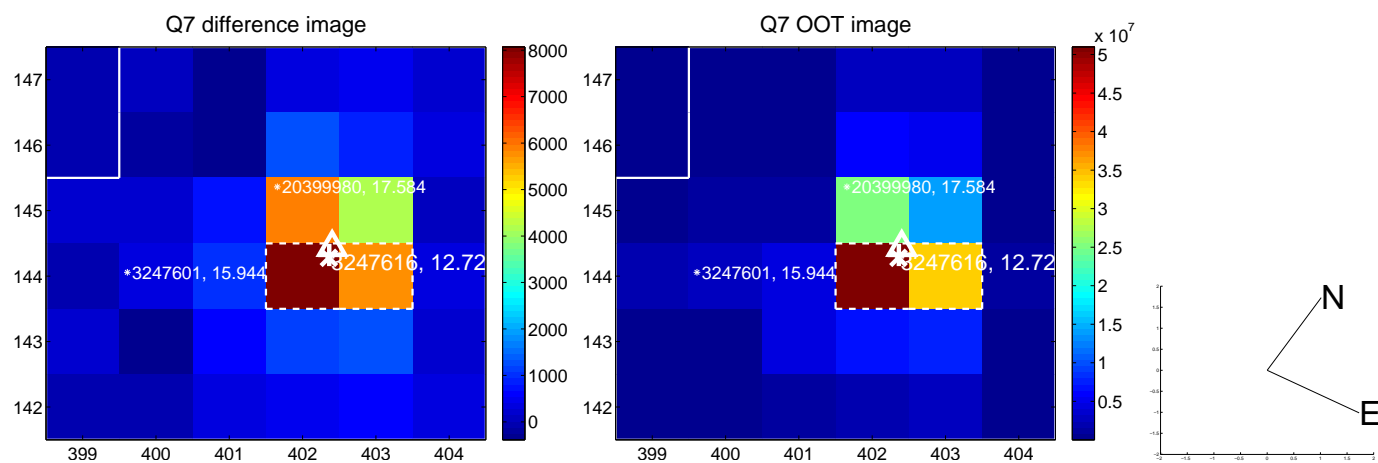
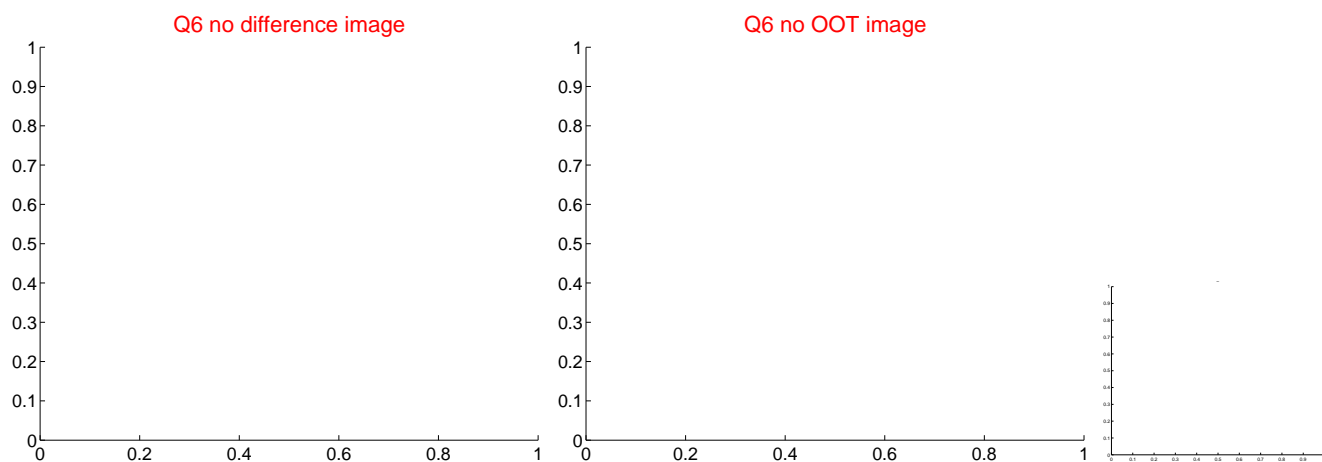
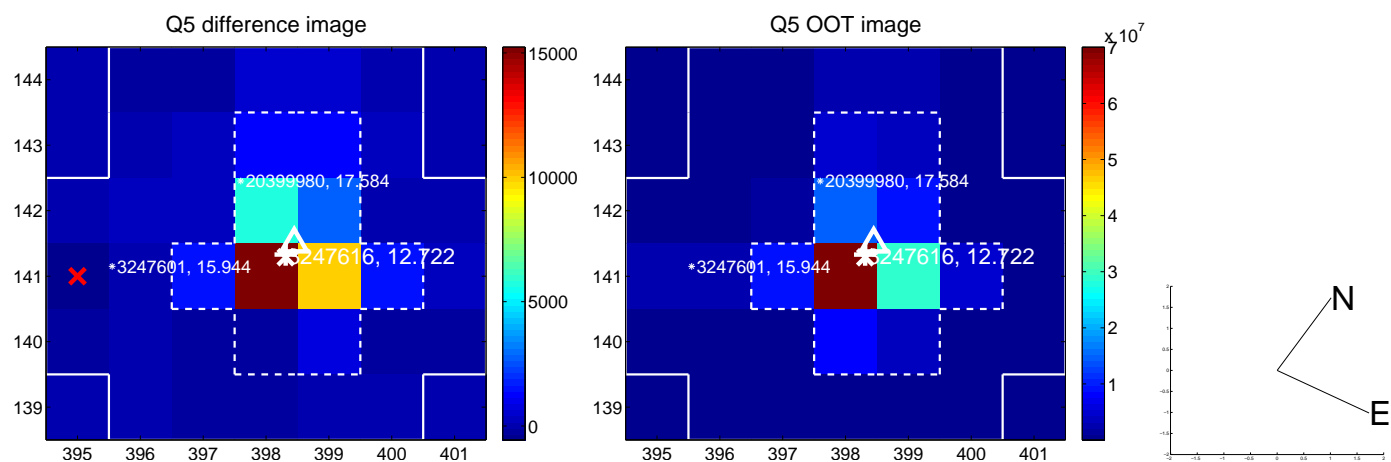
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.



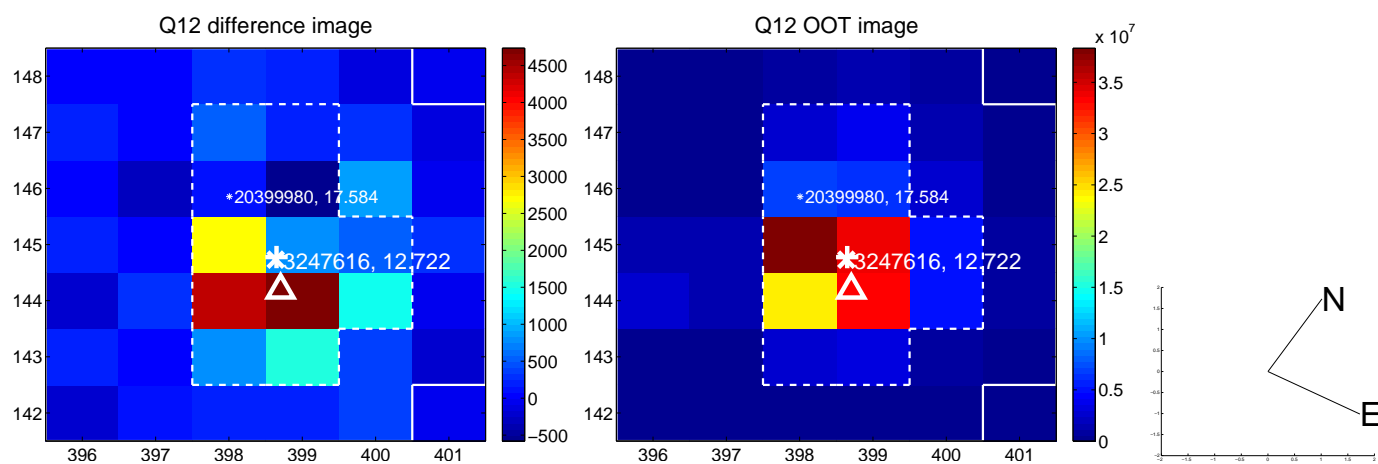
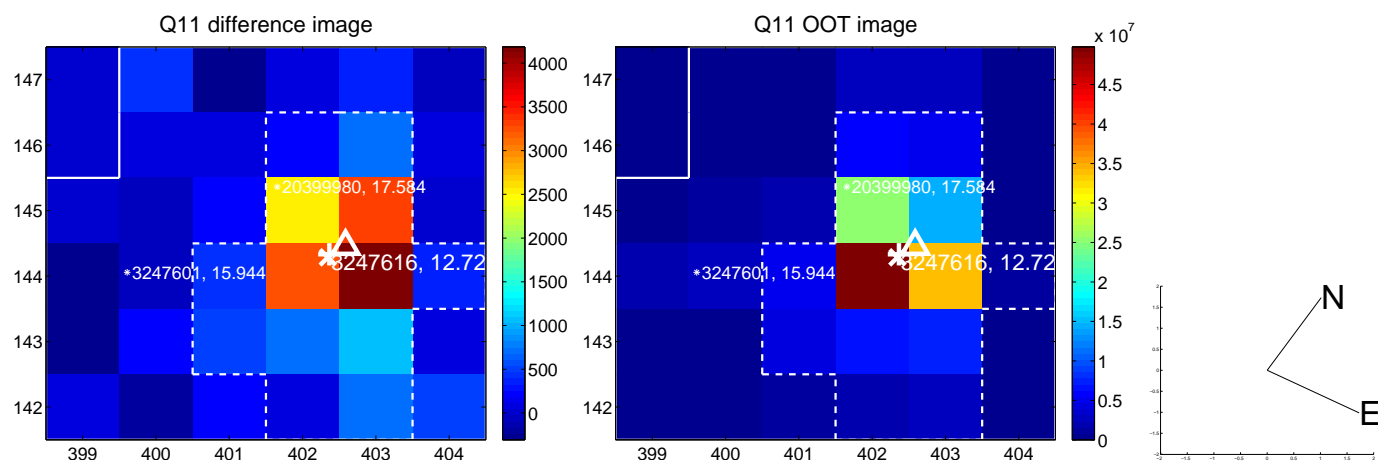
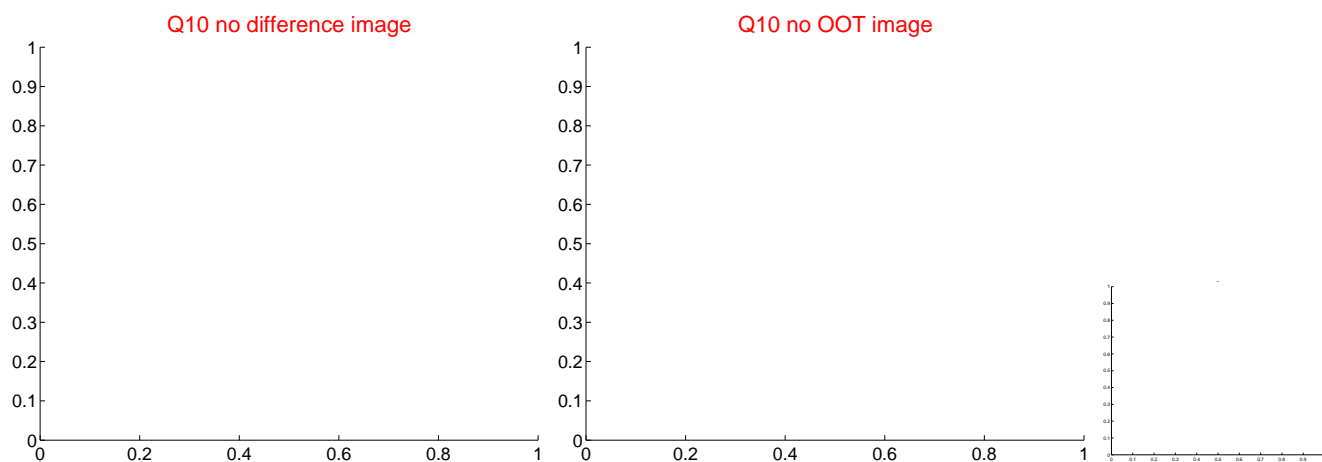
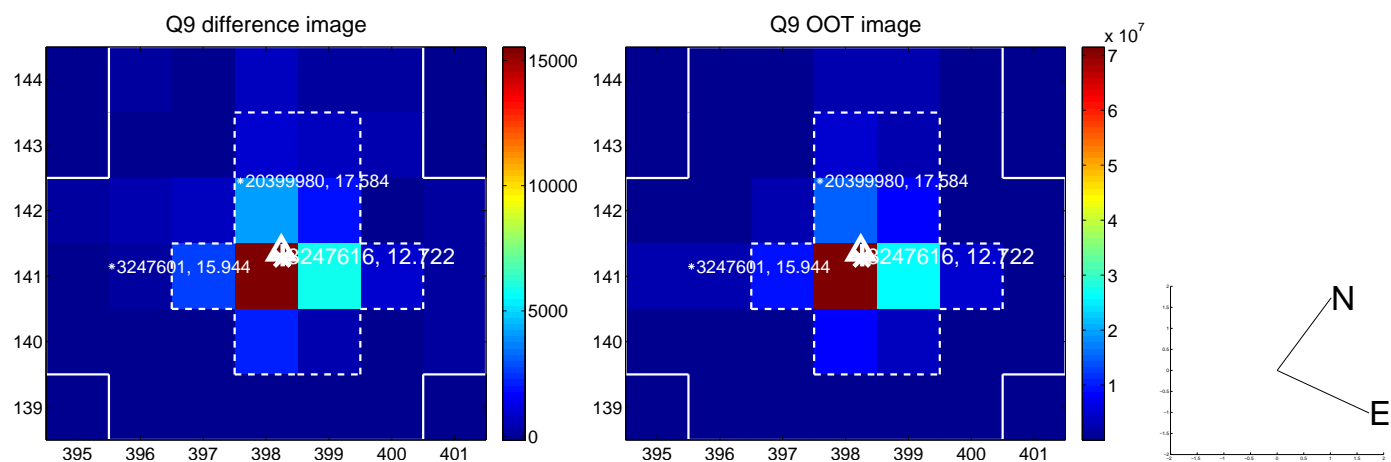
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



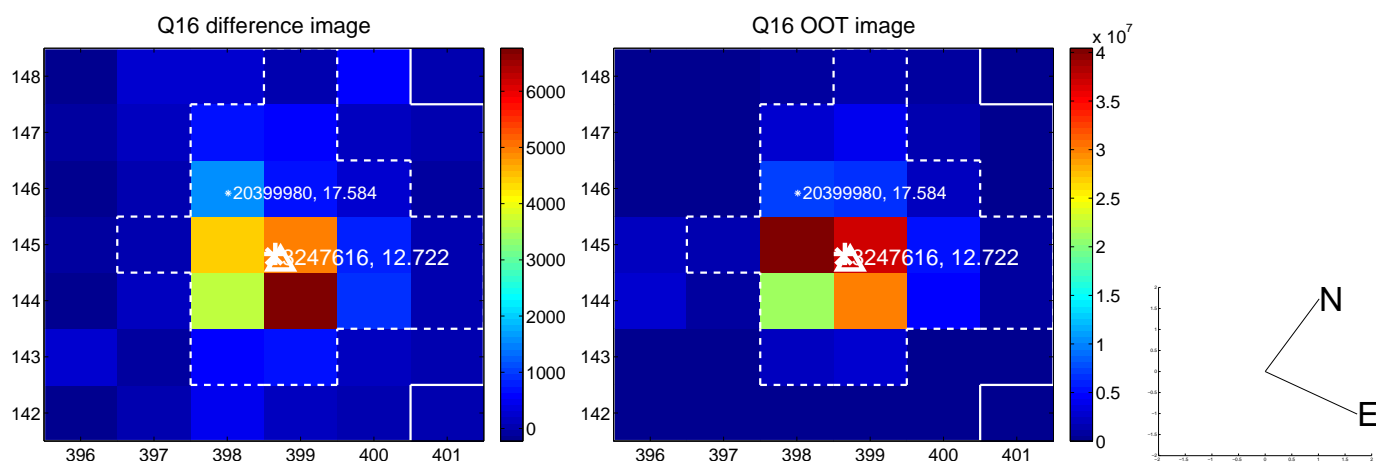
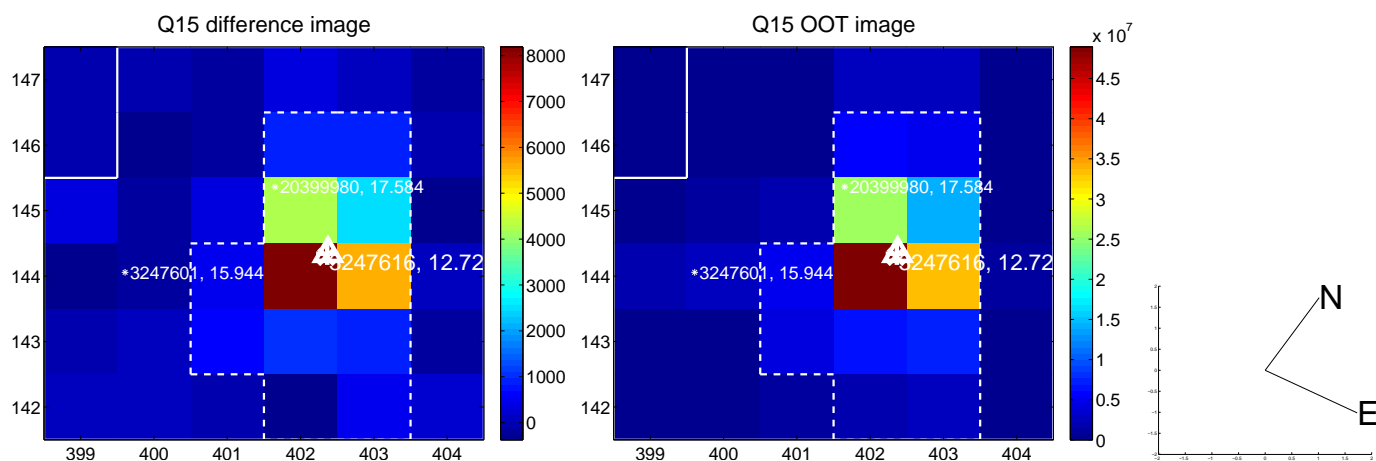
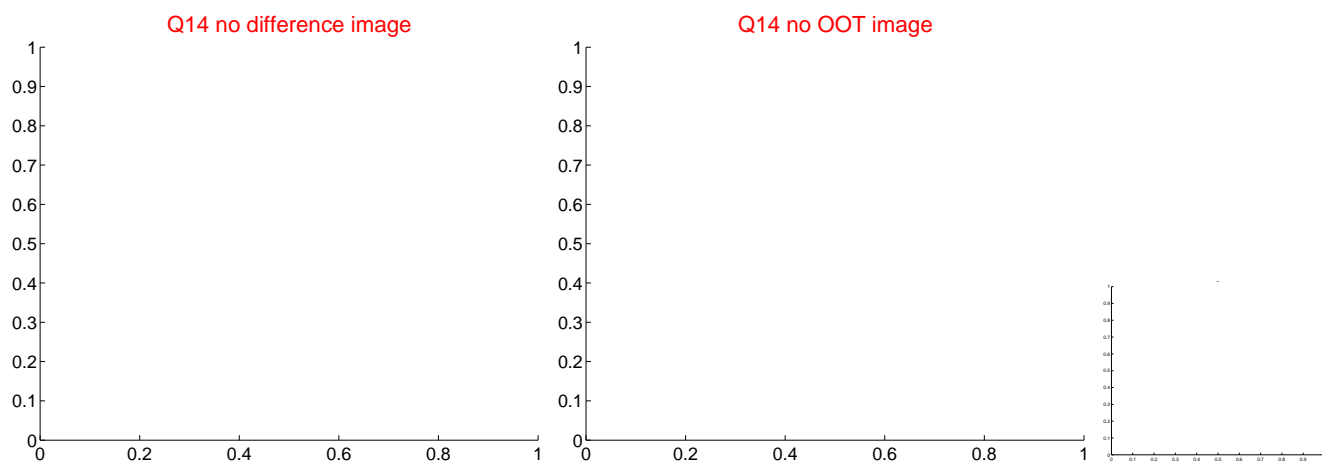
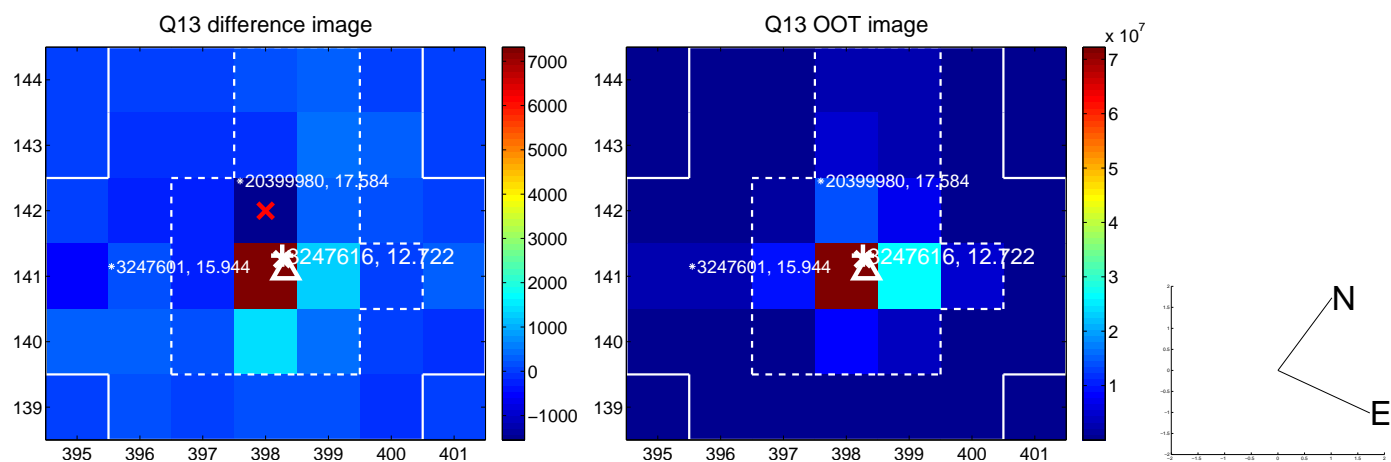
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



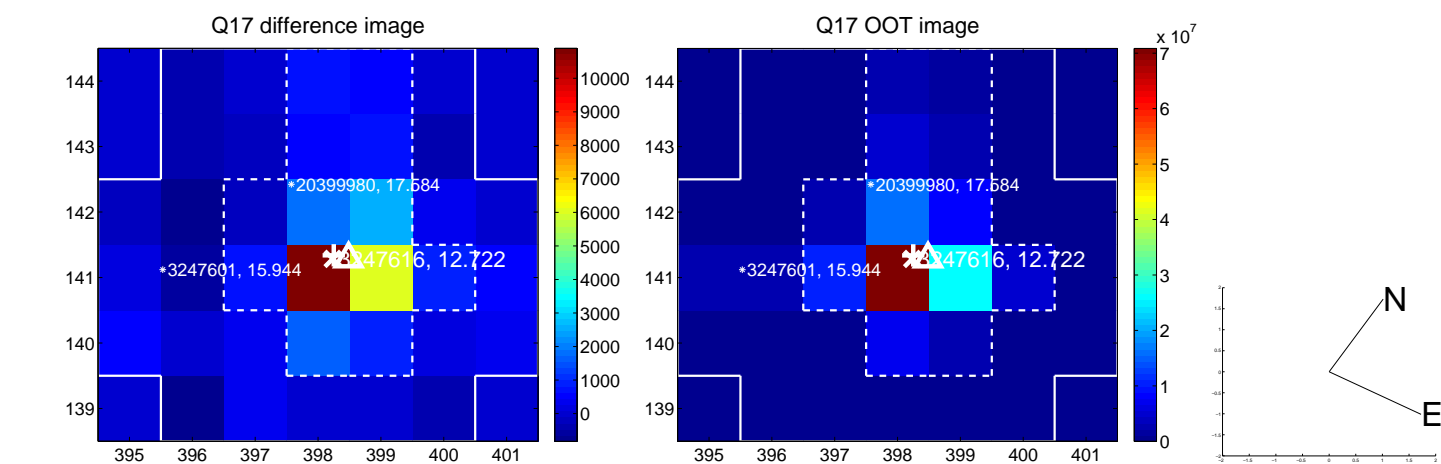
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



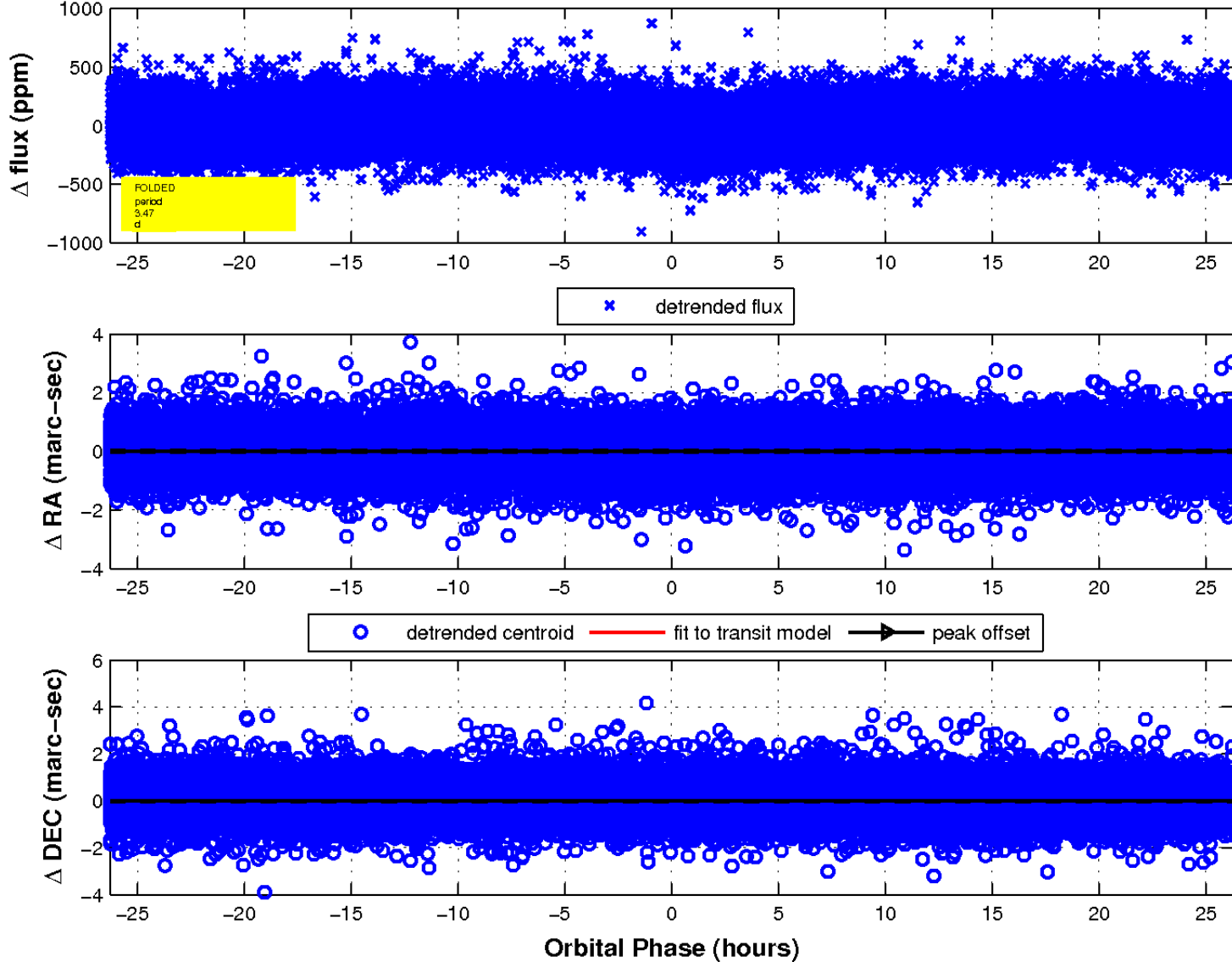
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

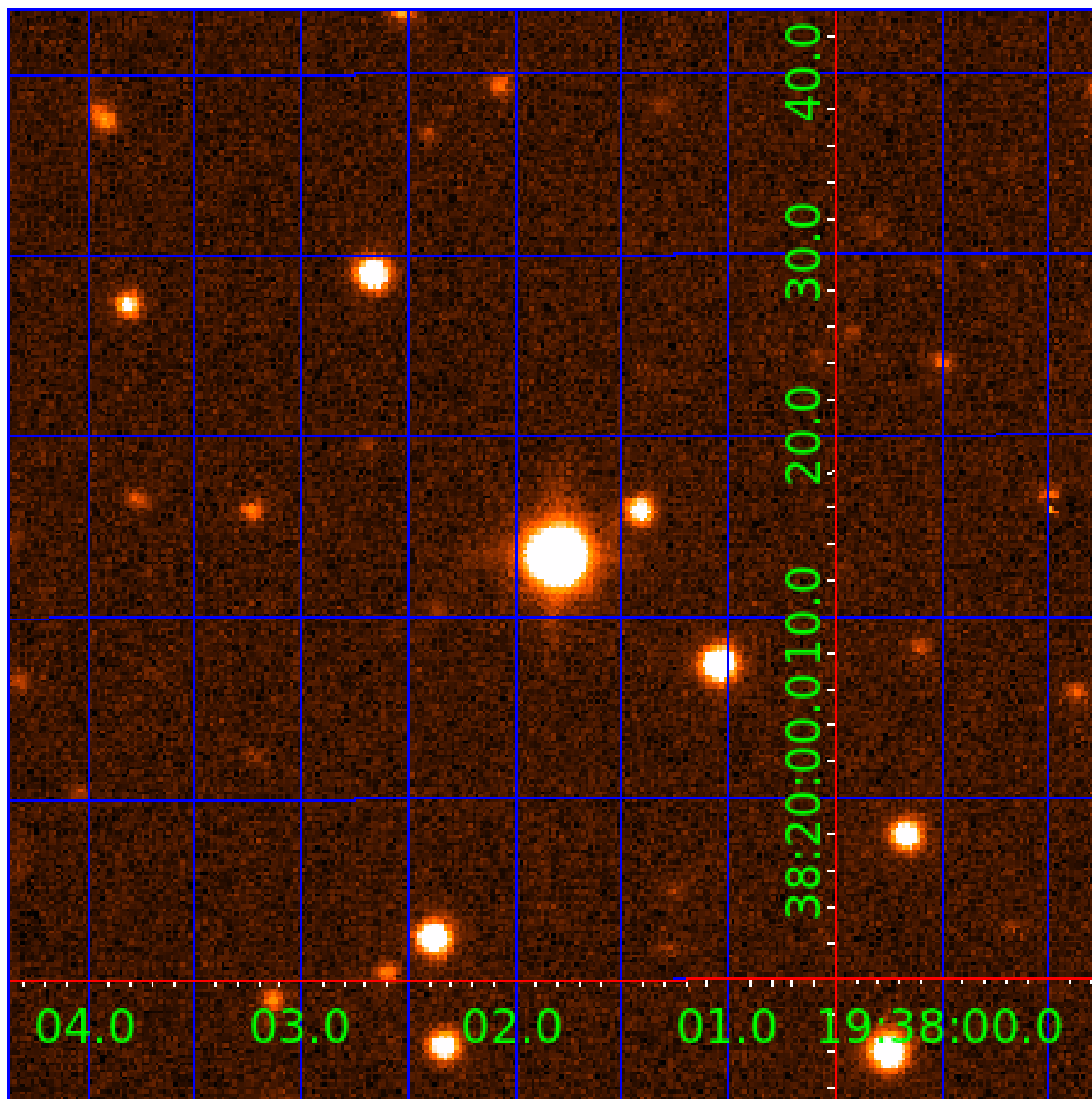


### fluxWeightedCentroids, Planet 3 of 7



UKIRT Image

Declination





# KIC 003247616

## Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	$R_{\star}$ ( $R_{\odot}$ )	$T_{\star}$ (K)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003247616-01	OBS	No	3.471928	132.100191	70.7	9.800	12.2	14.5	3.13	6915	4.99	7123.95
003247616-02	OBS	No	3.472358	134.876085	0.0	6.691	10.0	0.0	3.13	6915	0.01	7122.77
003247616-03	OBS	No	3.471931	134.373317	32.8	8.764	8.9	9.3	3.13	6915	2.22	7123.94
003247616-04	OBS	No	289.107157	379.348536	246.4	21.063	11.6	7.5	3.13	6915	5.82	19.59
003247616-05	OBS	No	126.523774	180.521913	349.7	3.437	8.5	9.1	3.13	6915	6.71	58.96
003247616-06	OBS	No	81.171074	206.811883	195.3	4.351	7.5	7.3	3.13	6915	4.94	106.56
003247616-07	OBS	No	148.796891	198.768348	291.8	4.044	7.3	7.9	3.13	6915	7.04	47.50

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003247616-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV
003247616-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—SWEET_NTL—LPP_DV—SAME_NTL_PERIOD—CENT_FEW_DIFFS
003247616-03	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—SAME_NTL_PERIOD
003247616-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
003247616-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT
003247616-06	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
003247616-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

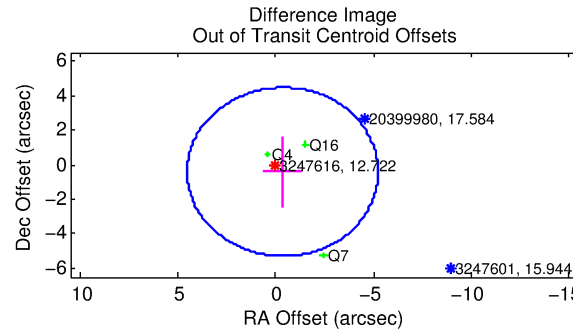
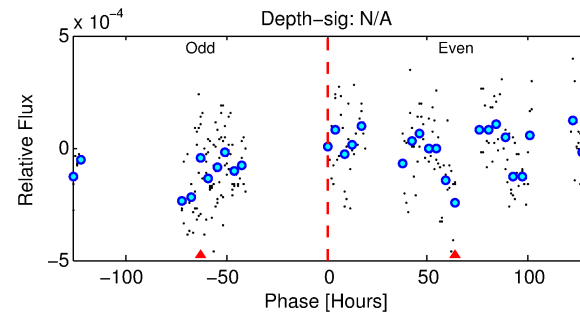
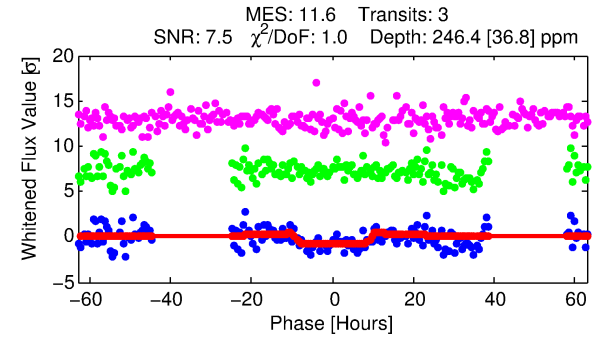
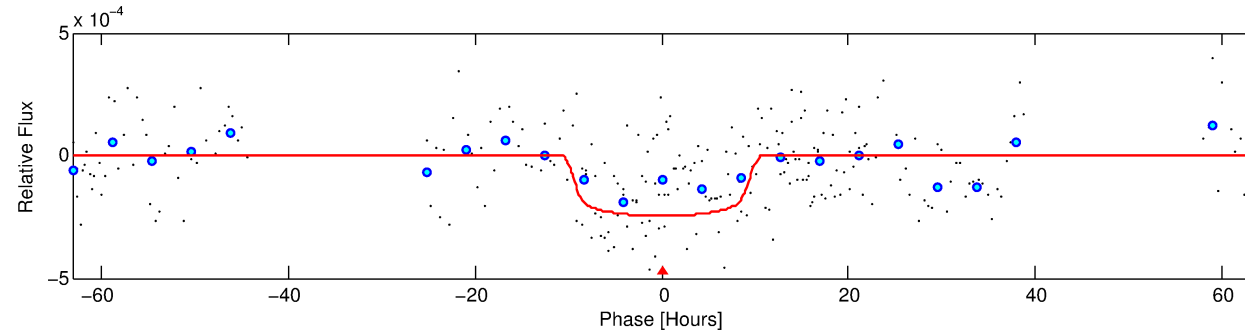
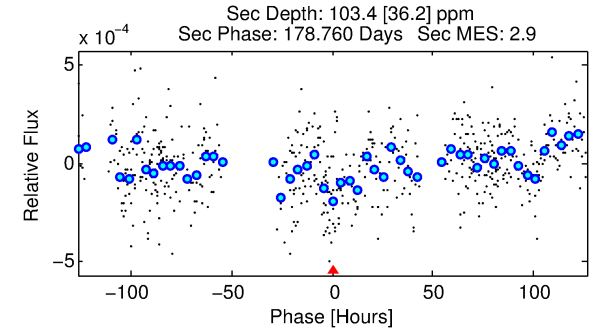
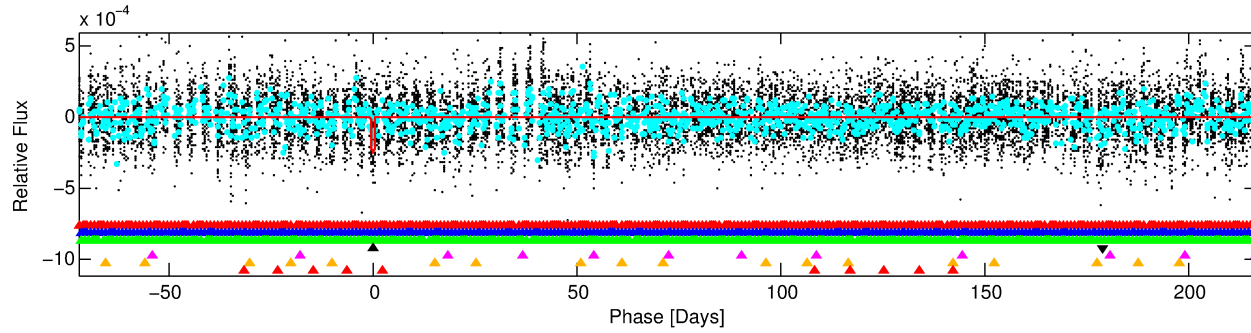
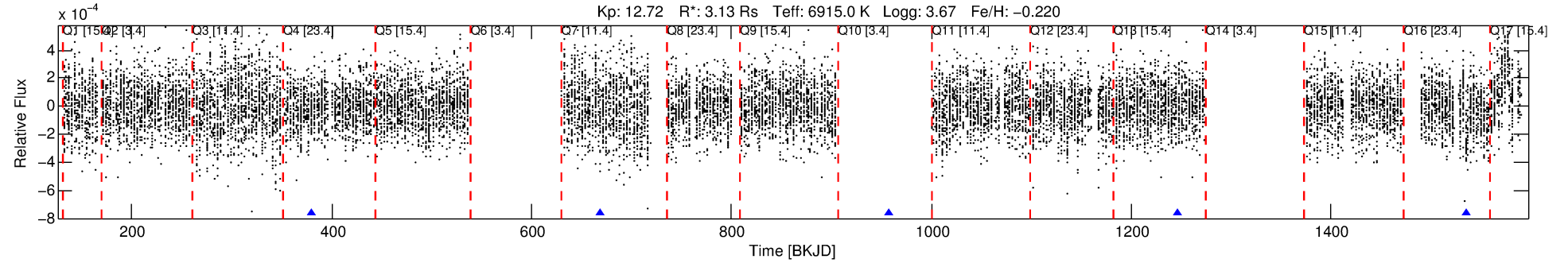
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 003247616-04

No Significant Match Found

# DV One-Page Summary

KIC: 3247616 Candidate: 4 of 7 Period: 289.107 d



## DV Fit Results:

Period = 289.10716 [0.01116] d  
Epoch = 379.3485 [0.0292] BKJD  
Rp/R\* = 0.0170 [0.0019]  
a/R\* = 44.86 [20.20]  
b = 0.92 [0.07]  
Seff = 19.59 [10.83]  
Teq = 536 [74] K  
Rp = 5.82 [2.13] Re  
a = 1.0112 [0.3392] AU  
Ag = 1719.15 [1164.13] [1.48σ]  
Teffp = 5341 [579] K [8.23σ]

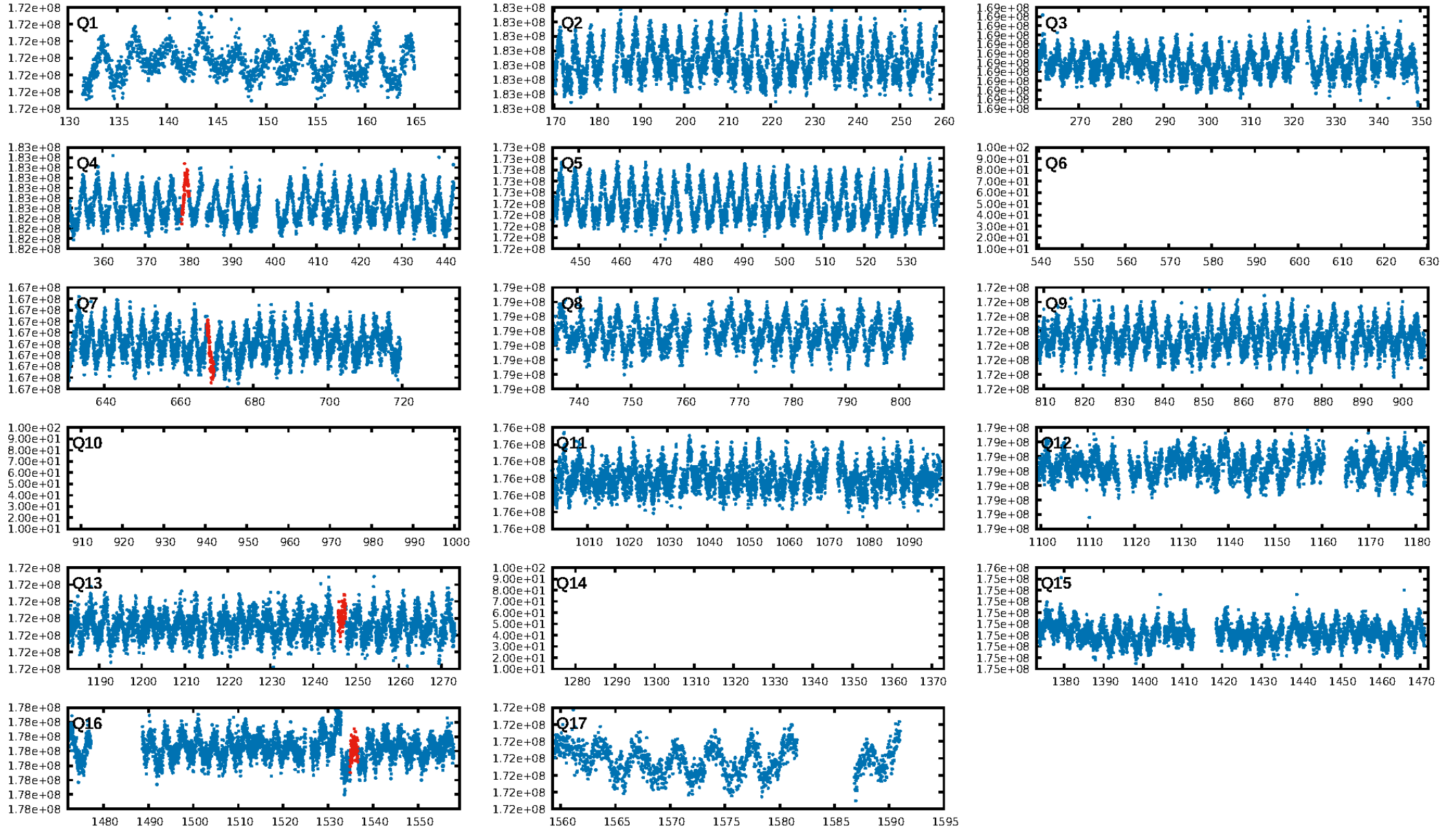
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [157.01σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 32.1%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.73e-15  
RollingBand-fgt: 1.00 [3/3]  
**GhostDiagnostic-chr: 0.3851**  
Centroid-sig: 0.8%  
Centroid-so: 1.571 arcsec [2.27σ]  
OotOffset-rm: 0.554 arcsec [0.34σ]  
KicOffset-rm: 0.474 arcsec [0.31σ]  
OotOffset-st: 0/1/2/0 [3]  
KicOffset-st: 0/1/2/0 [3]  
DiffImageQuality-fgm: 0.00 [0/3]  
DiffImageOverlap-fno: 0.00 [0/3]

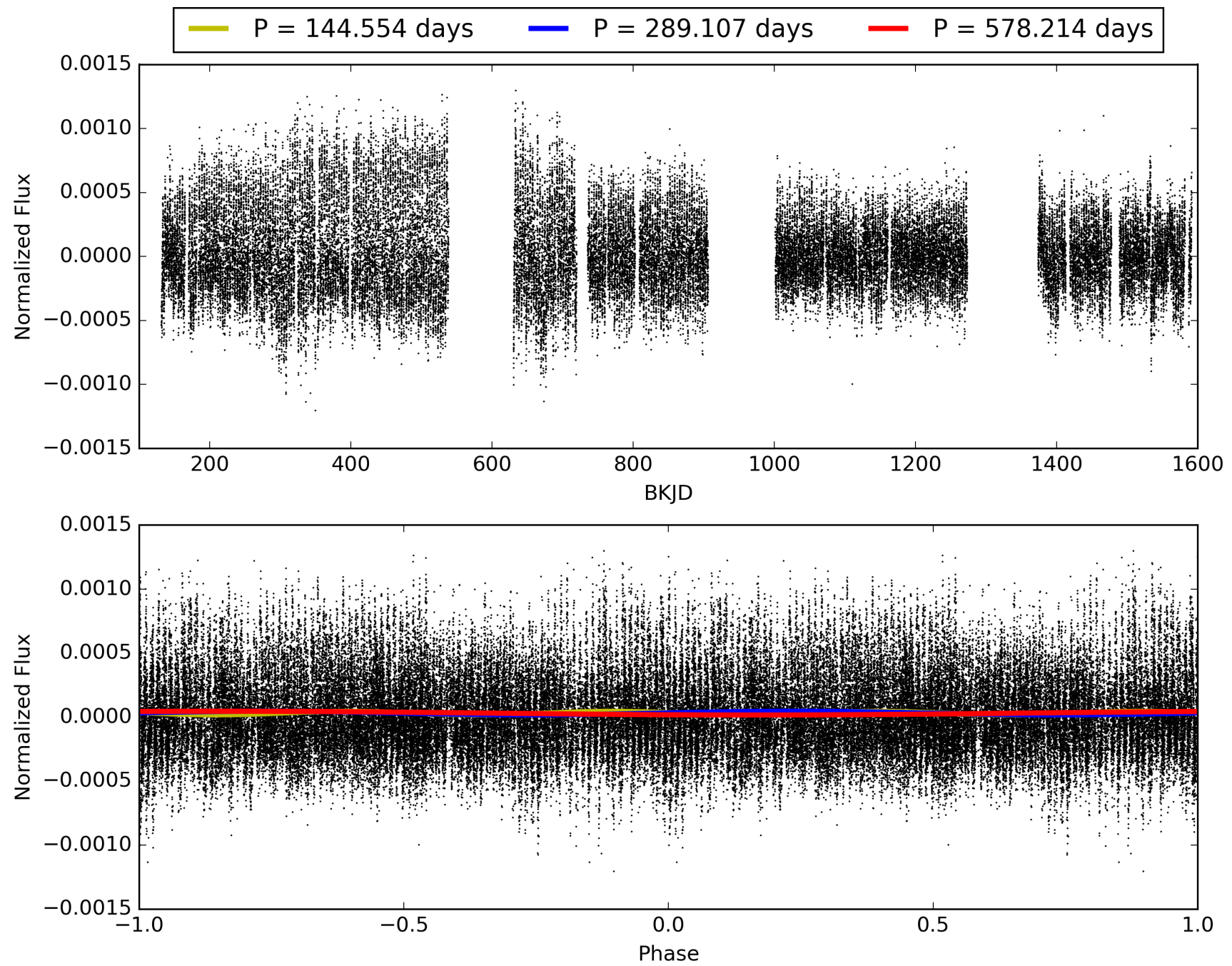
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 13:10:16 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 003247616-04, PDC Light Curves

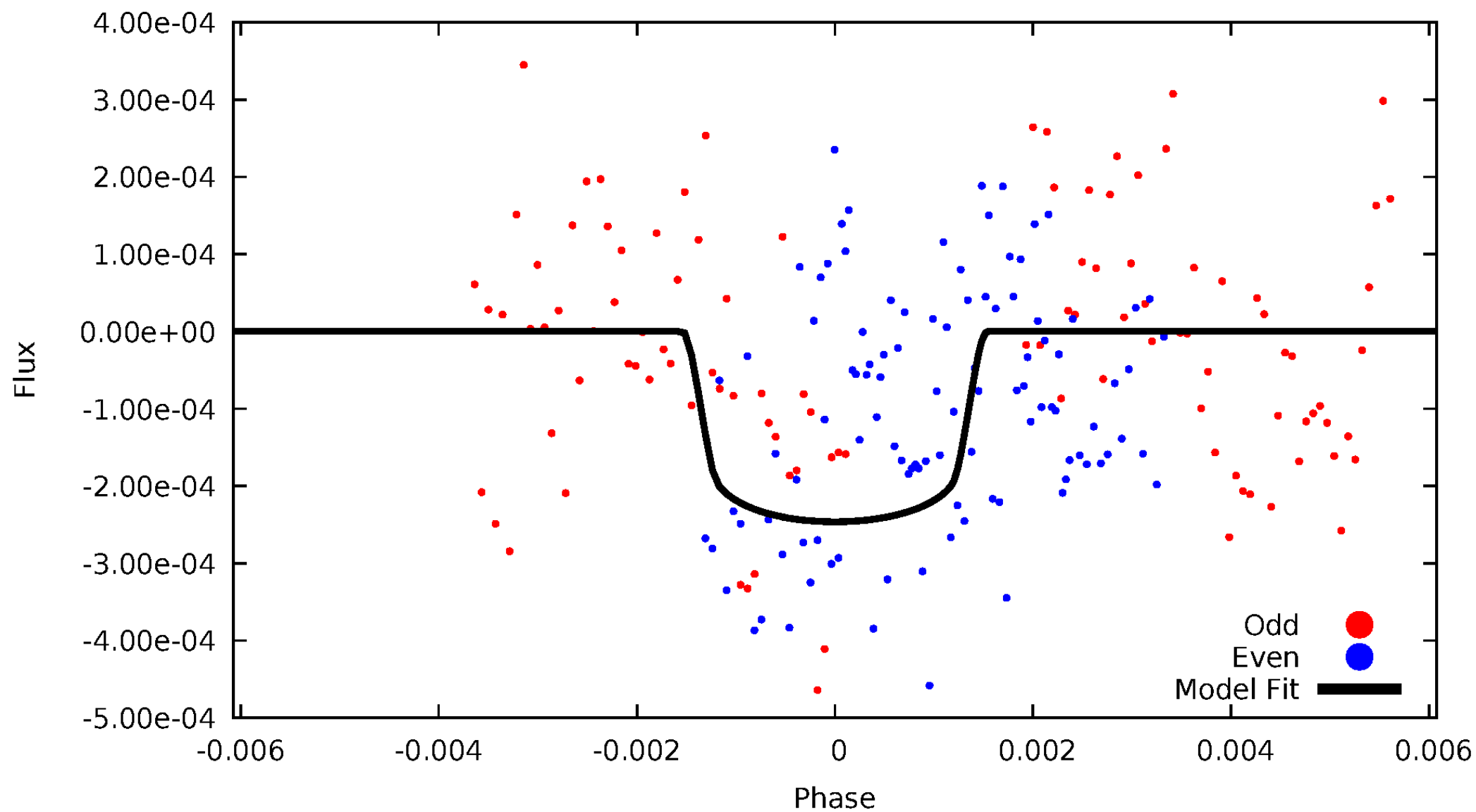


TCE 003247616-04



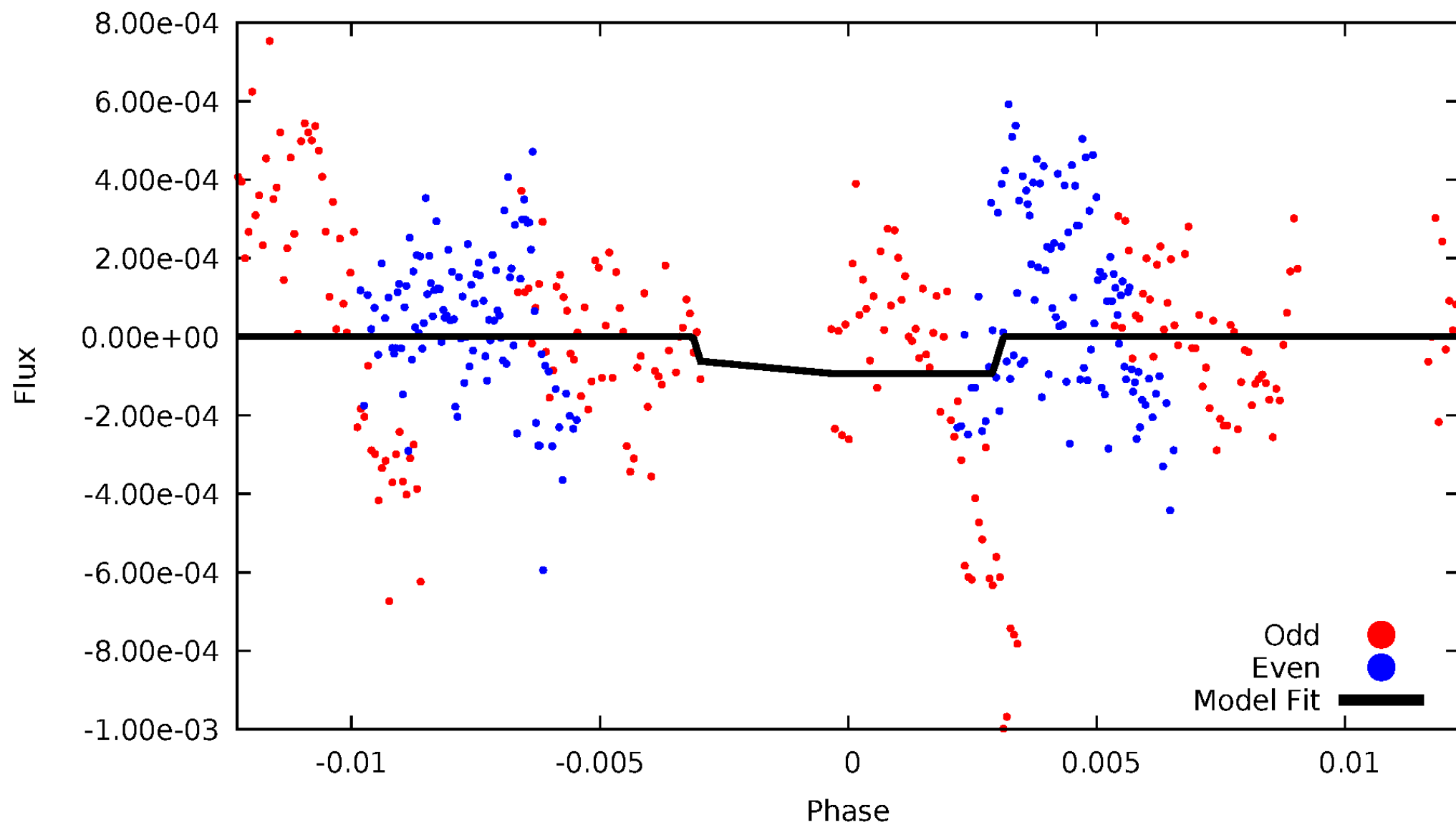
# DV Odd/Even

TCE 003247616-04



# ALT Odd/Even

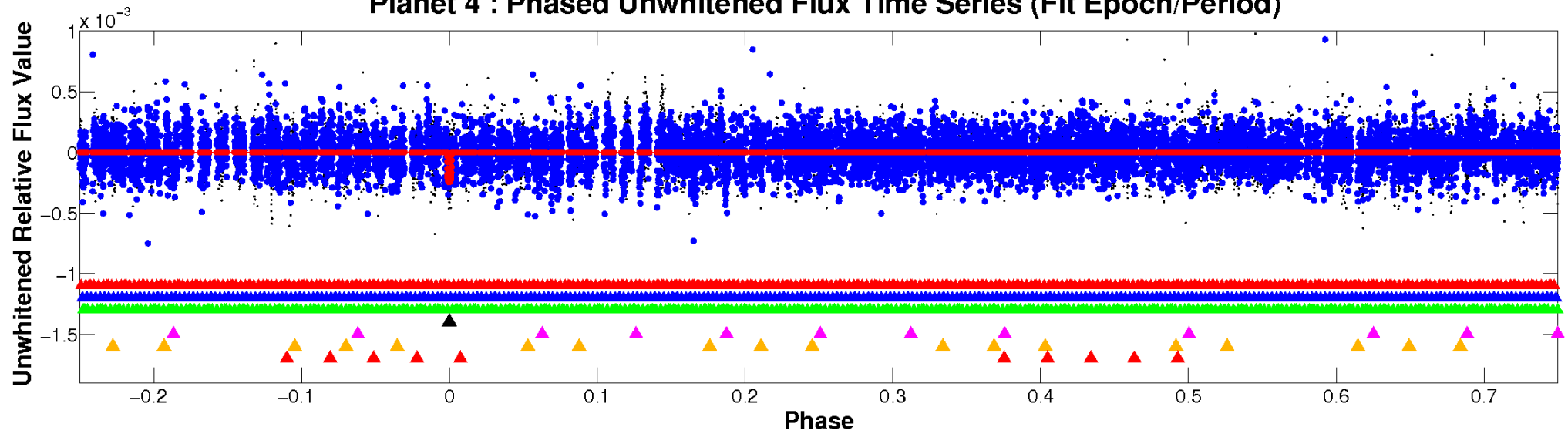
TCE 003247616-04



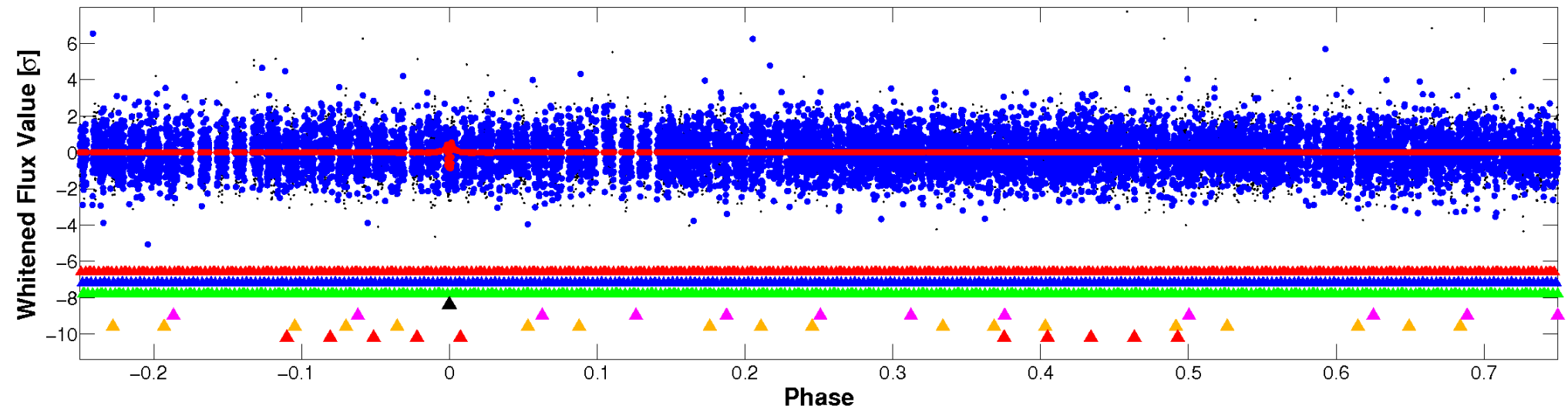


# Non-Whitened Vs. Whitened Light Curve

## Planet 4 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

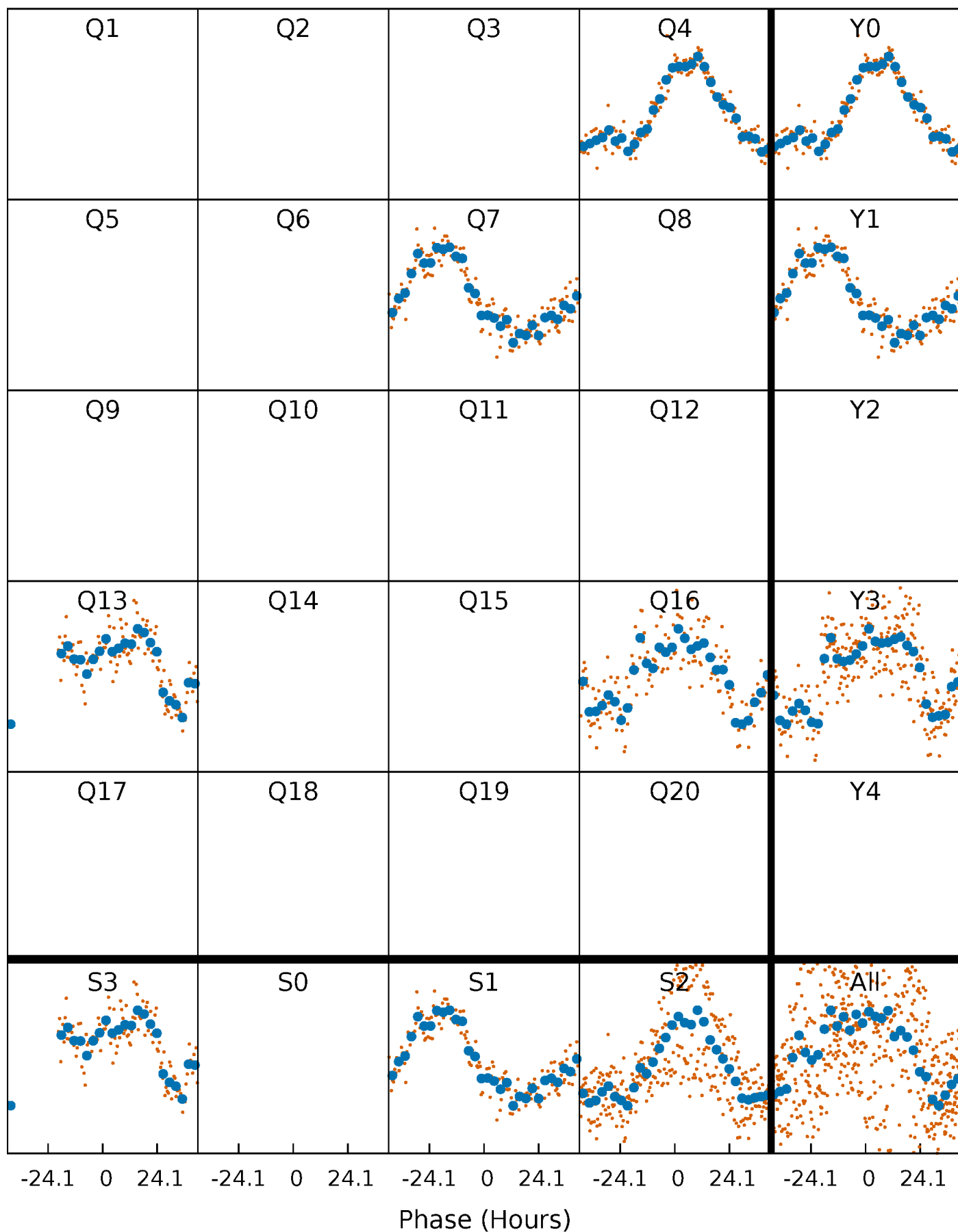


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



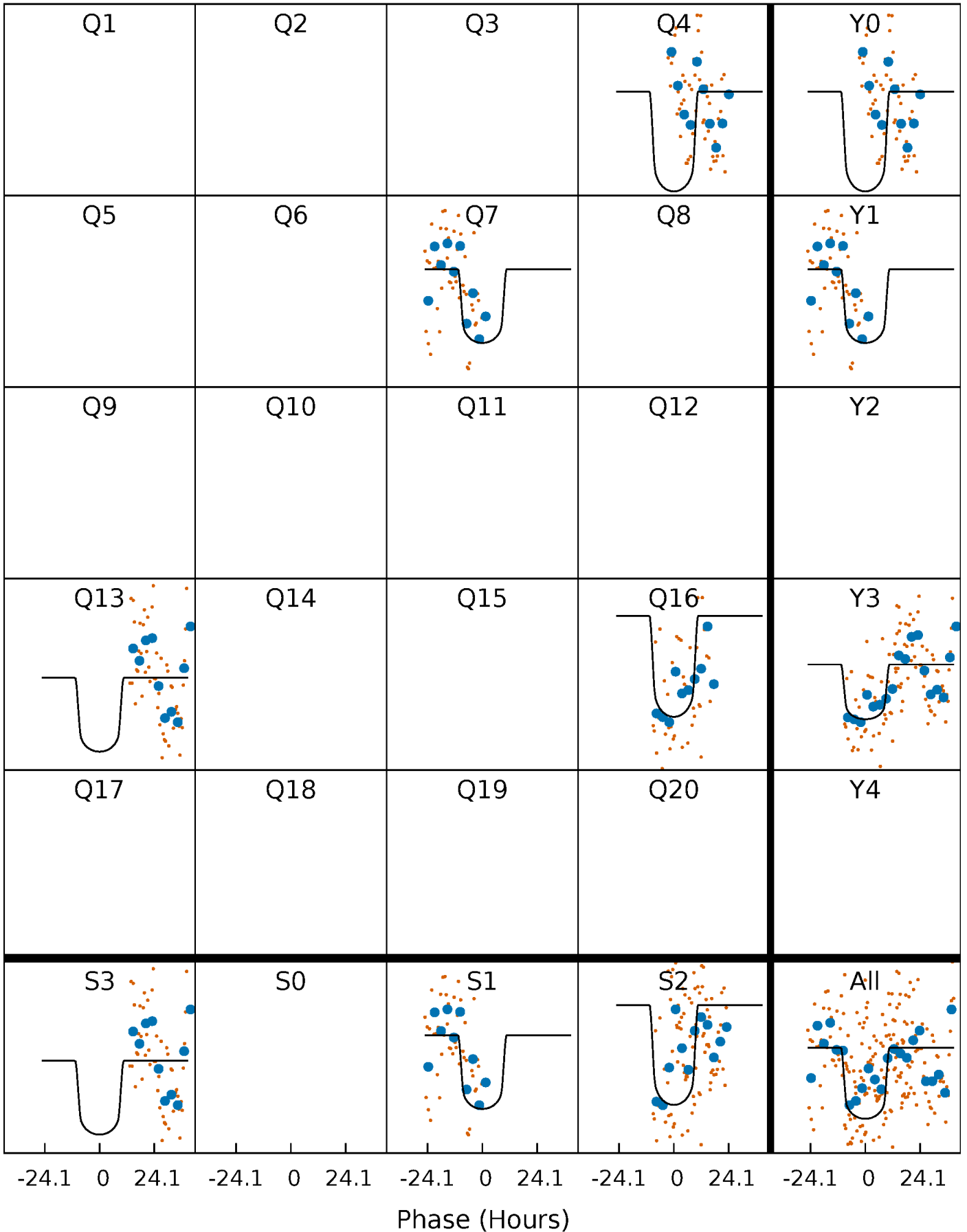
# PDC Quarter-Phased Transit Curves

TCE 003247616-04 P=289.107157 Days  $T_0=379.348537$  (BKJD)



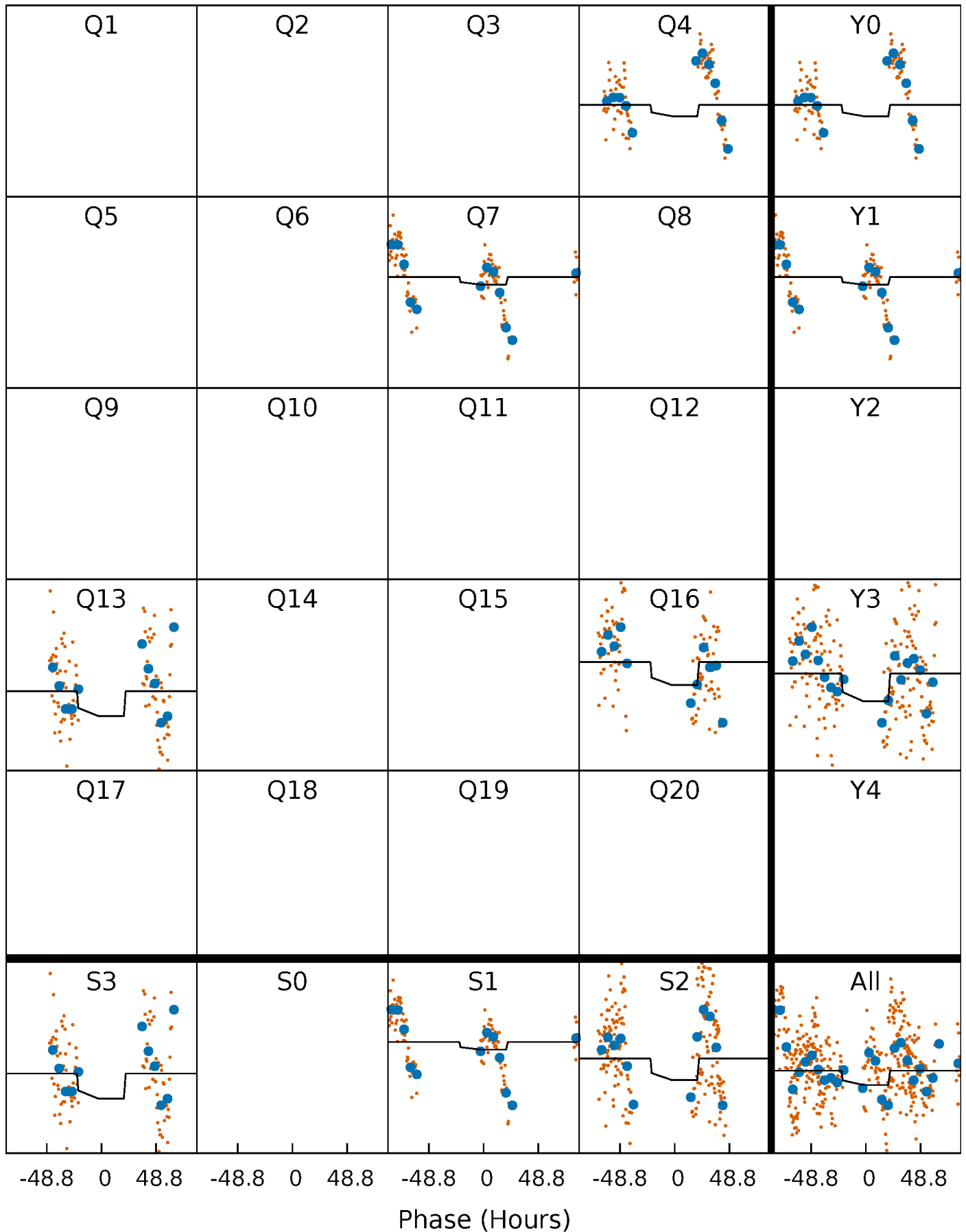
# DV Quarter-Phased Transit Curves

TCE 003247616-04     $P=289.107157$  Days     $T_0=379.348537$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

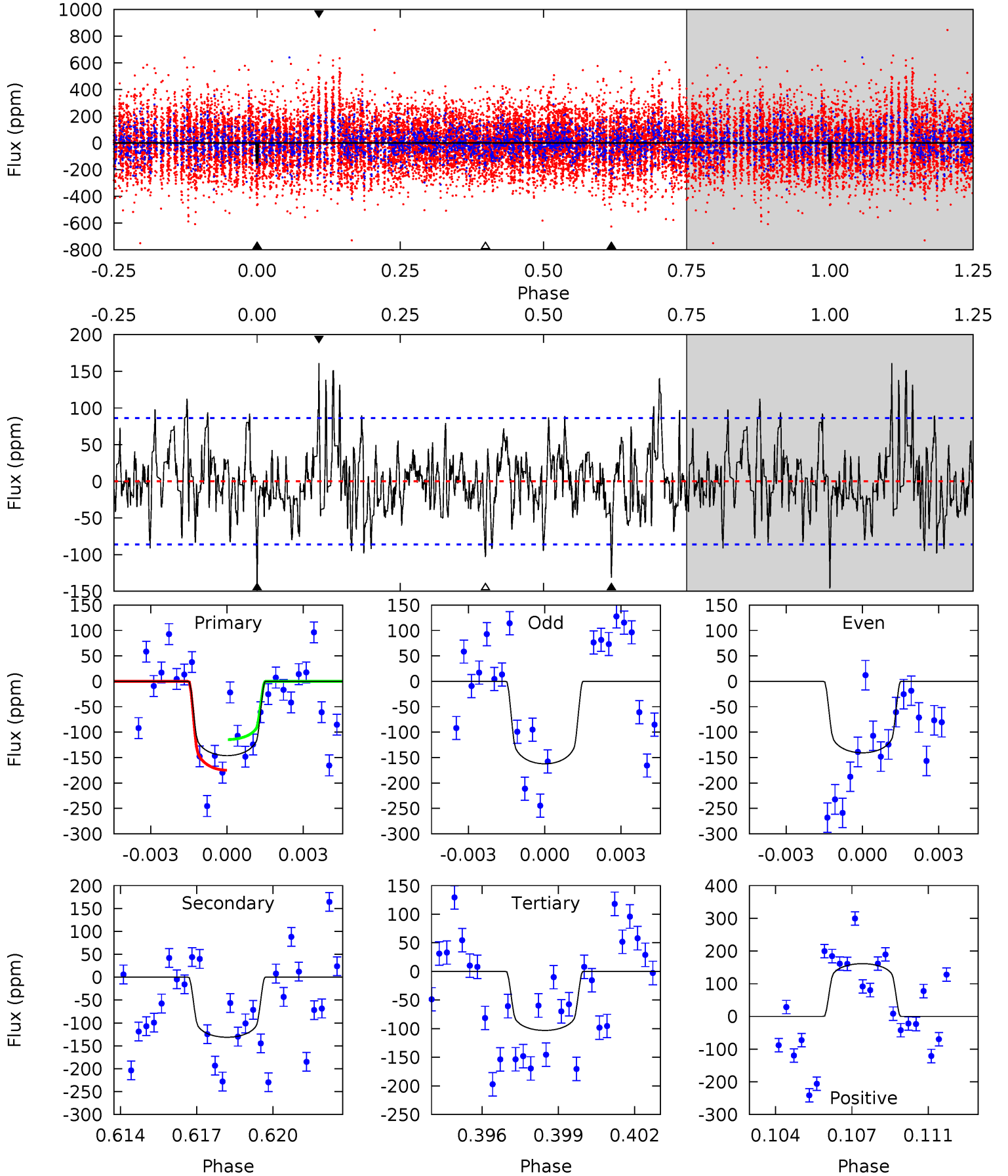
TCE 003247616-04     $P=289.087196$  Days     $T_0=378.415351$  (BKJD)



# DV Model-Shift Uniqueness Test

003247616-04,  $P = 289.107157$  Days,  $E = 90.241380$  Days

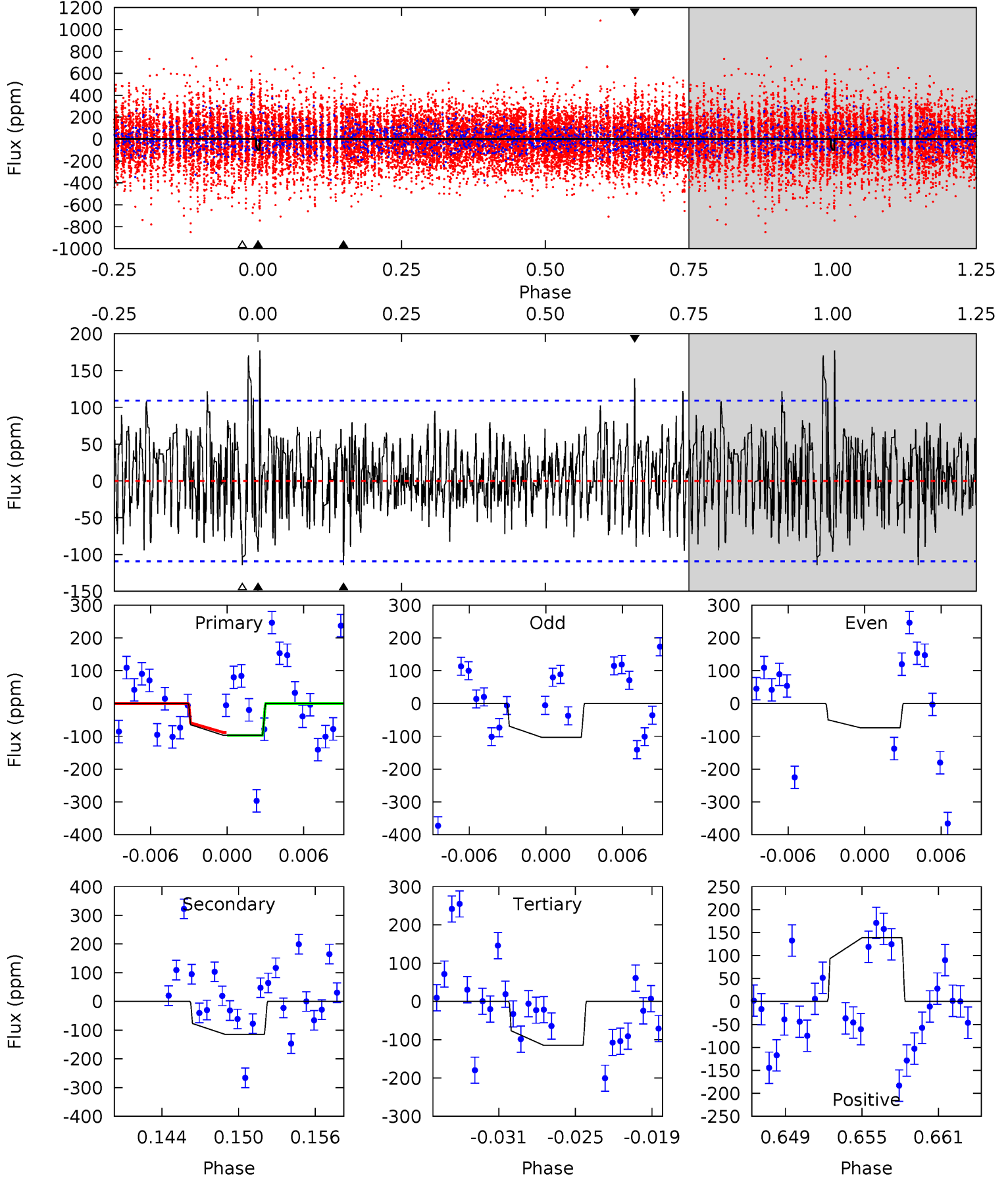
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.90	7.99	6.28	9.81	5.25	2.96	2.37	2.62	-0.92	1.72	-1.82	0.58	0.81	0.52	1.83



# Alt Model-Shift Uniqueness Test

003247616-04, P = 289.087196 Days, E = 89.328155 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.52	5.36	5.36	6.51	5.12	2.73	1.79	-0.84	-2.00	0.00	-1.15	0.59	-0.19	0.61	0.13





### Stellar Parameters For KIC 003247616

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6915^{+187}_{-229}$	$3.665^{+0.315}_{-0.074}$	$-0.220^{+0.300}_{-0.250}$	$3.127^{+0.390}_{-1.091}$	$1.651^{+0.208}_{-0.312}$	$0.076^{+0.155}_{-0.018}$
	+3%/-3%	+9%/-2%	+136%/-114%	+12%/-35%	+13%/-19%	+204%/-24%
Source	PHO1	FLK73	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 003247616-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-131 \pm 16$	$5.51^{+0.92}_{-1.13}$	$731^{+40}_{-65}$	$5639^{+427}_{-332}$	$2503^{+1202}_{-733}$
Alt.	$-114 \pm 21$	$3.09^{+0.88}_{-0.77}$	$735^{+42}_{-67}$	$7198^{+1242}_{-761}$	$6399^{+5556}_{-2432}$

$T_{\text{max}}$  = Theoretical Maximum Planetary Temperature  
 $T_{\text{obs}}$  = Observed Planetary Temperature (Assuming A=0.3)  
 $A_{\text{obs}}$  = Observed Albedo (Assuming T=0)

If a secondary eclipse is present, the system is likely an EB if  $T_{\text{obs}} \gg T_{\text{max}}$  AND  $A_{\text{obs}} \gg 1.0$

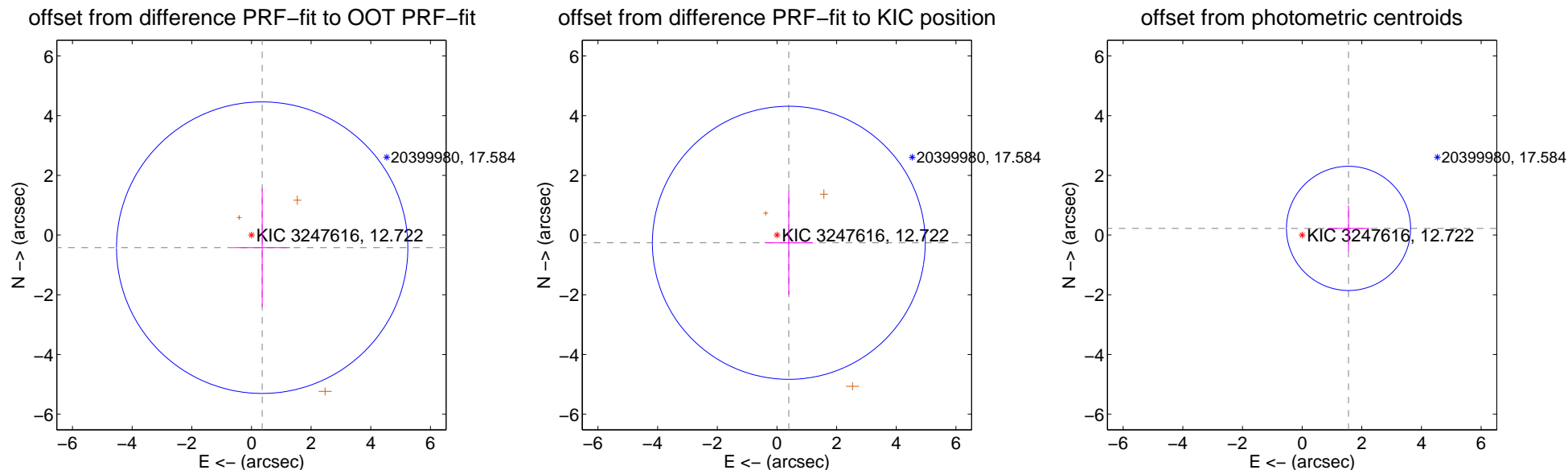
## DV Centroid Data

Supplemental centroid analysis for 003247616-04. Kepler magnitude: 12.72. Transit SNR 7.53

There are 0 quarters with good PRF difference image offsets

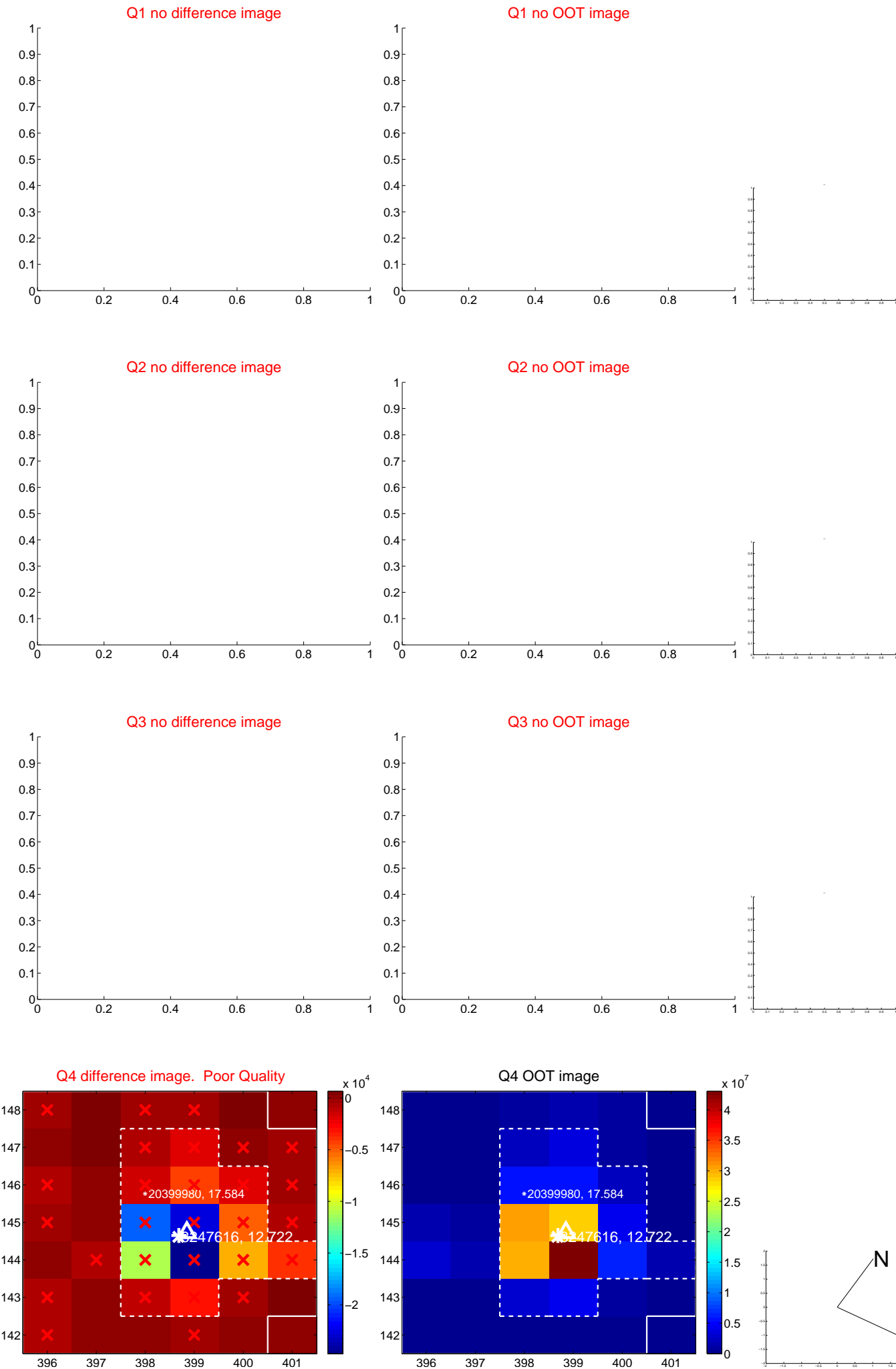
The direct PRF centroid is offset from the target star catalog position by about 0.21 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.554 \pm 1.627$	0.34	$-0.359 \pm 0.937$	$-0.422 \pm 1.983$
PRF-fit source offset from KIC position	$0.474 \pm 1.524$	0.31	$-0.398 \pm 0.808$	$-0.258 \pm 1.742$
photometric centroid source offset	$1.57 \pm 0.69$	2.27	$-1.55 \pm 0.69$	$0.22 \pm 0.77$



Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

Q5 no difference image



Q5 no OOT image



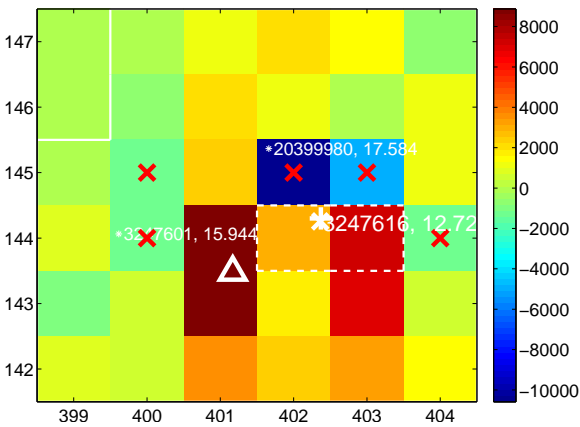
Q6 no difference image



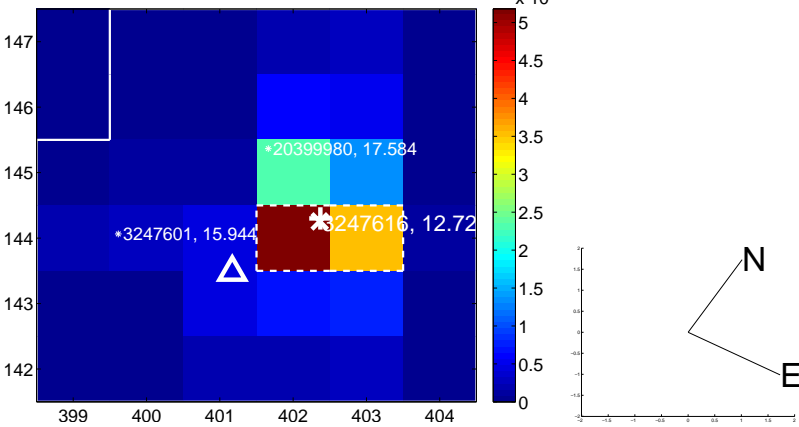
Q6 no OOT image



Q7 difference image. Poor Quality



Q7 OOT image



Q8 no difference image



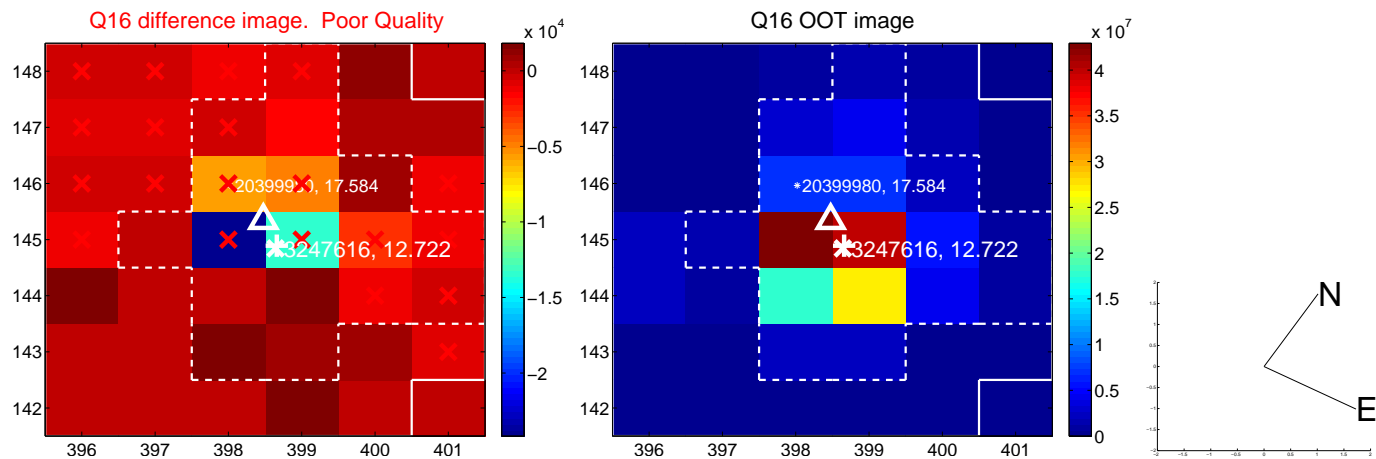
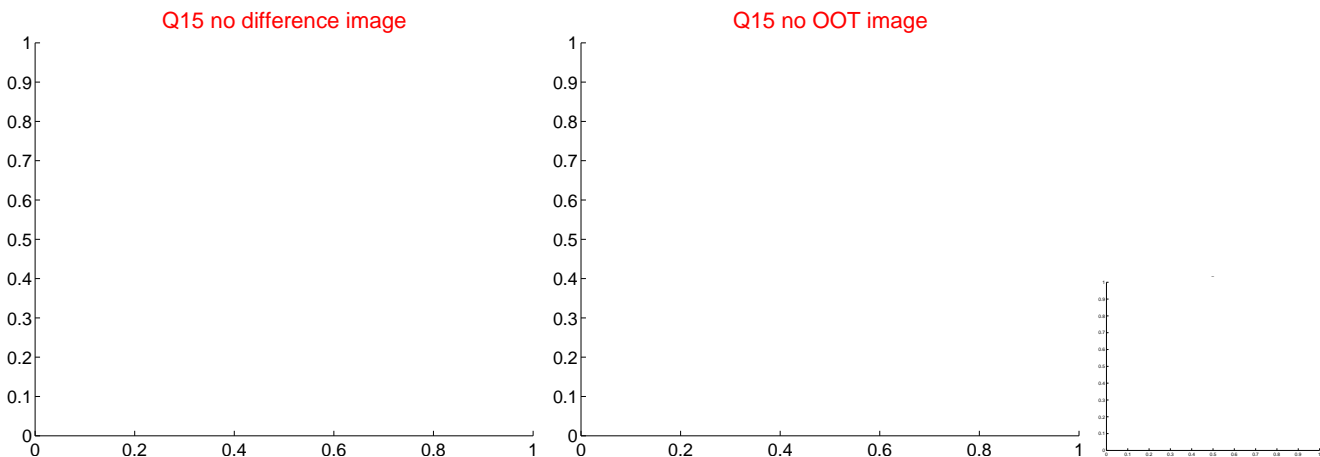
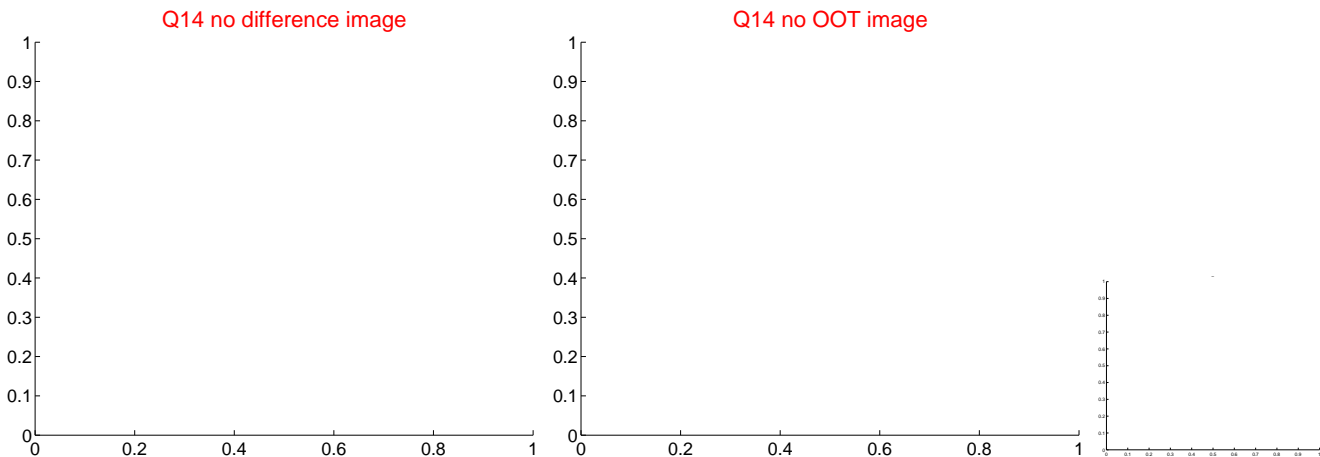
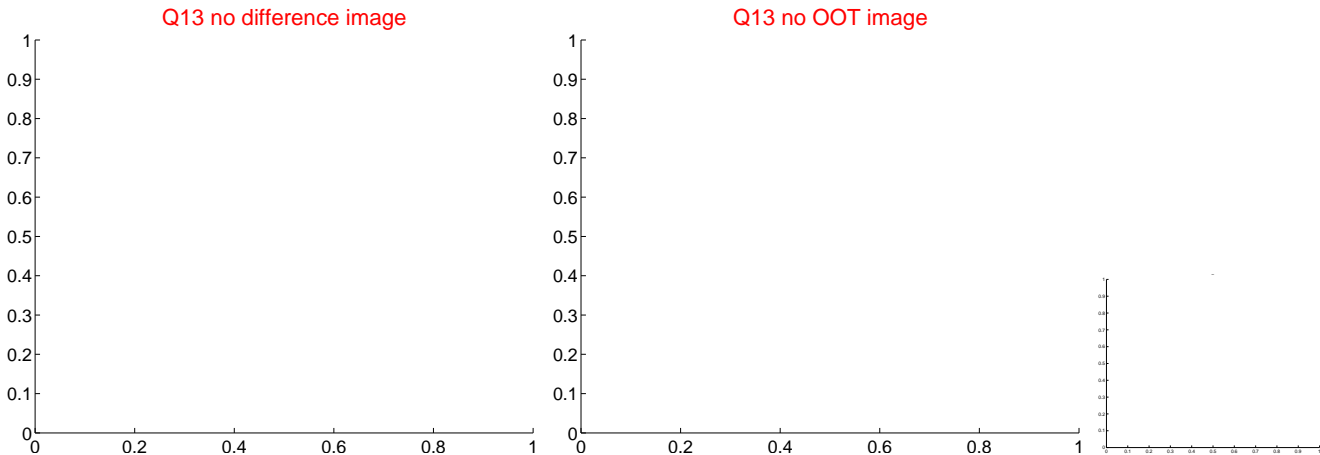
Q8 no OOT image



white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

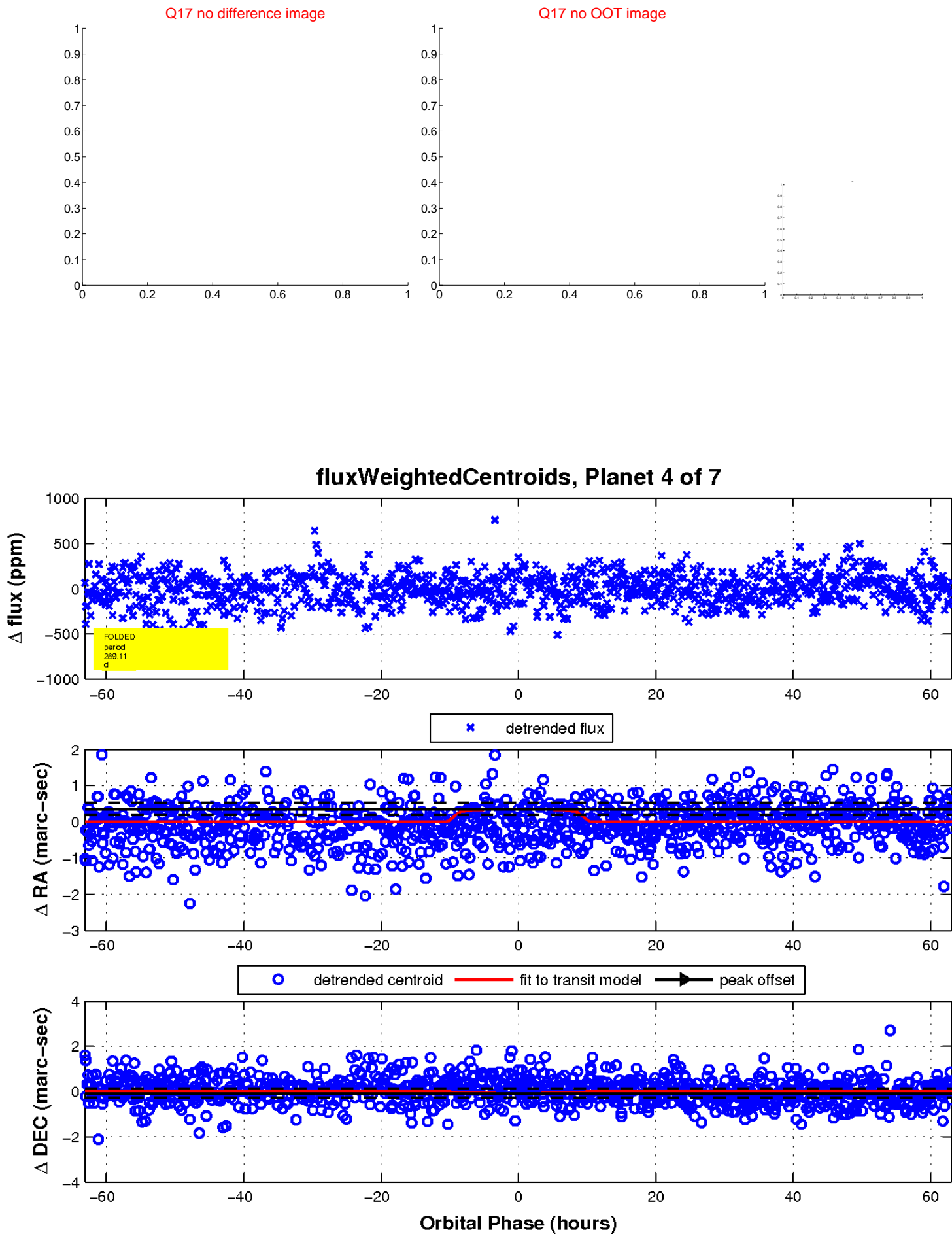


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



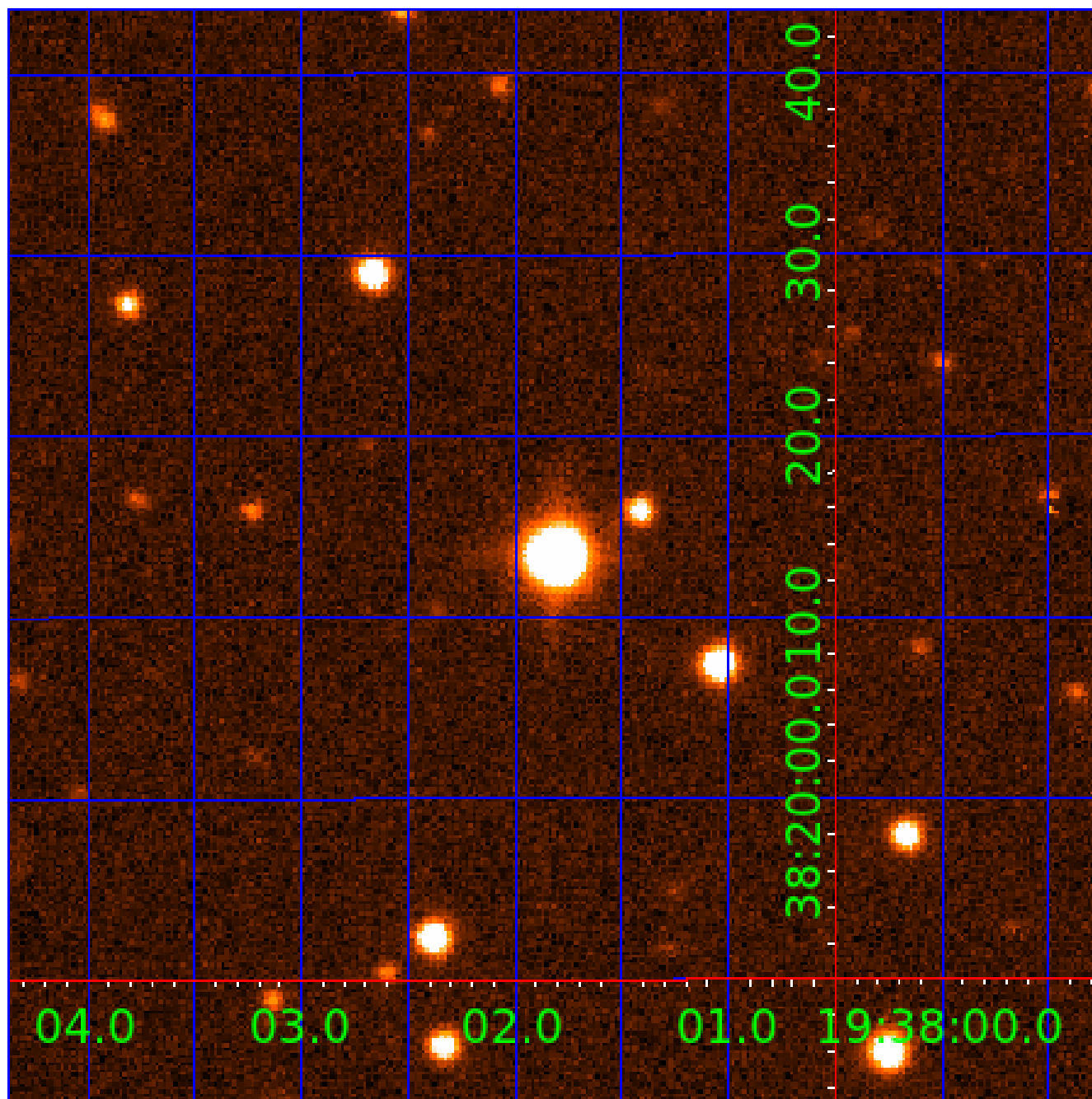


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 003247616

## Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	$R_{\star}$ ( $R_{\odot}$ )	$T_{\star}$ (K)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003247616-01	OBS	No	3.471928	132.100191	70.7	9.800	12.2	14.5	3.13	6915	4.99	7123.95
003247616-02	OBS	No	3.472358	134.876085	0.0	6.691	10.0	0.0	3.13	6915	0.01	7122.77
003247616-03	OBS	No	3.471931	134.373317	32.8	8.764	8.9	9.3	3.13	6915	2.22	7123.94
003247616-04	OBS	No	289.107157	379.348536	246.4	21.063	11.6	7.5	3.13	6915	5.82	19.59
003247616-05	OBS	No	126.523774	180.521913	349.7	3.437	8.5	9.1	3.13	6915	6.71	58.96
003247616-06	OBS	No	81.171074	206.811883	195.3	4.351	7.5	7.3	3.13	6915	4.94	106.56
003247616-07	OBS	No	148.796891	198.768348	291.8	4.044	7.3	7.9	3.13	6915	7.04	47.50

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003247616-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV
003247616-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—SWEET_NTL—LPP_DV—SAME_NTL_PERIOD—CENT_FEW_DIFFS
003247616-03	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—SAME_NTL_PERIOD
003247616-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
003247616-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT
003247616-06	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
003247616-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

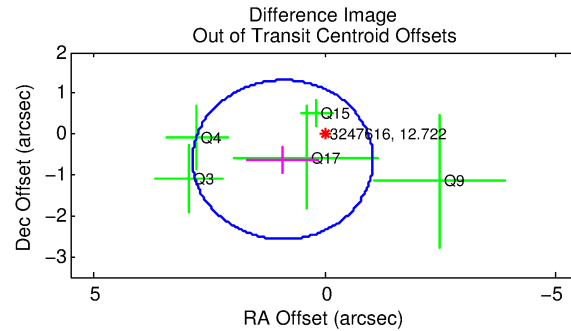
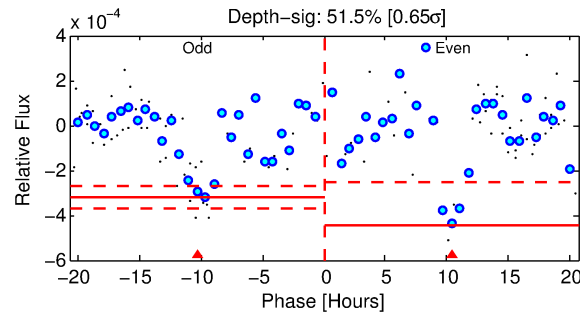
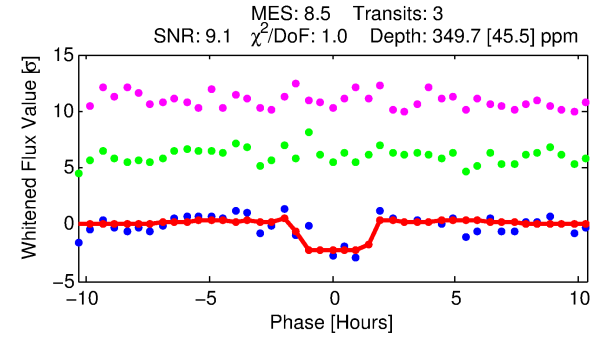
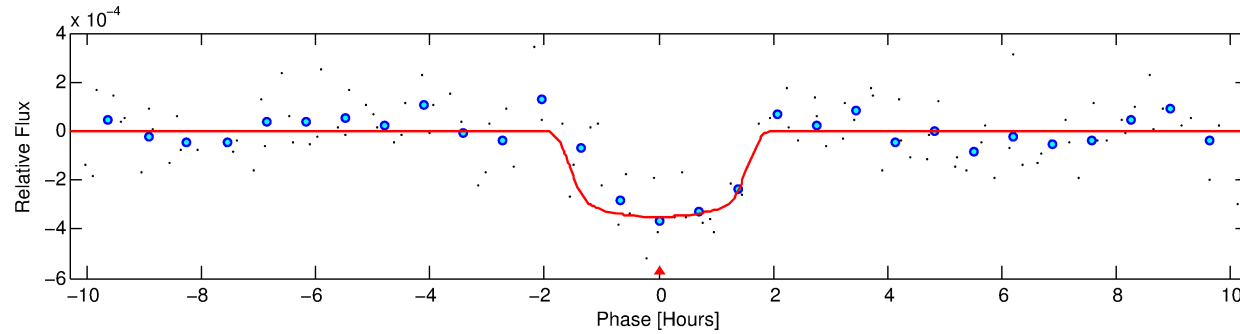
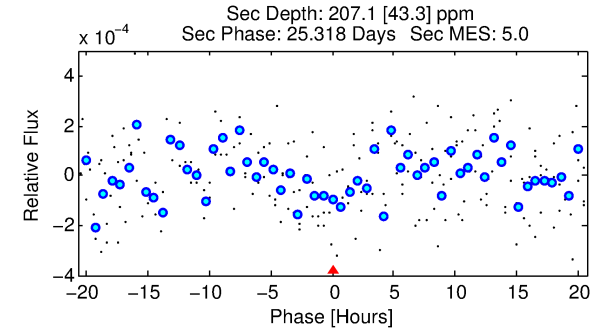
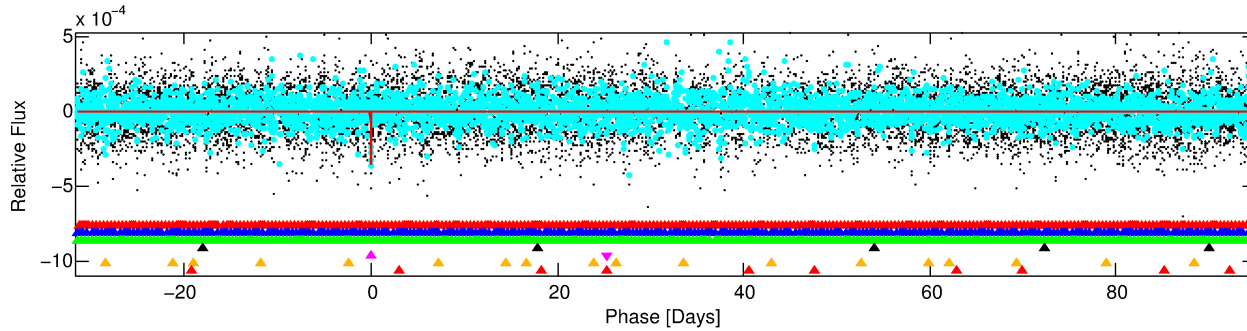
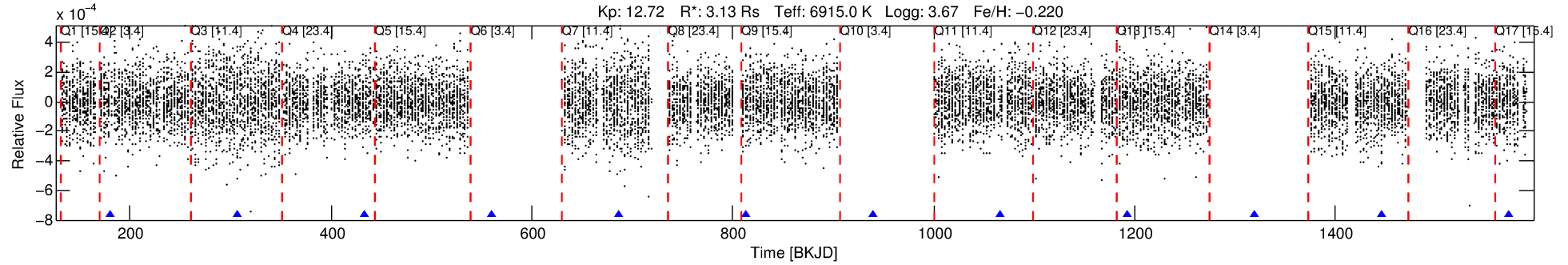
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 003247616-05

No Significant Match Found

# DV One-Page Summary

KIC: 3247616 Candidate: 5 of 7 Period: 126.524 d



## DV Fit Results:

Period = 126.52377 [0.00101] d  
Epoch = 180.5219 [0.0085] BKJD  
Rp/R\* = 0.0197 [0.0161]  
a/R\* = 143.95 [706.29]  
b = 0.88 [1.25]  
Seff = 58.96 [32.59]  
Teq = 707 [98] K  
Rp = 6.71 [5.96] Re  
a = 0.5829 [0.1955] AU  
Ag = 858.81 [1485.82] [0.58σ]  
Teffp = 5914 [2440] K [2.13σ]

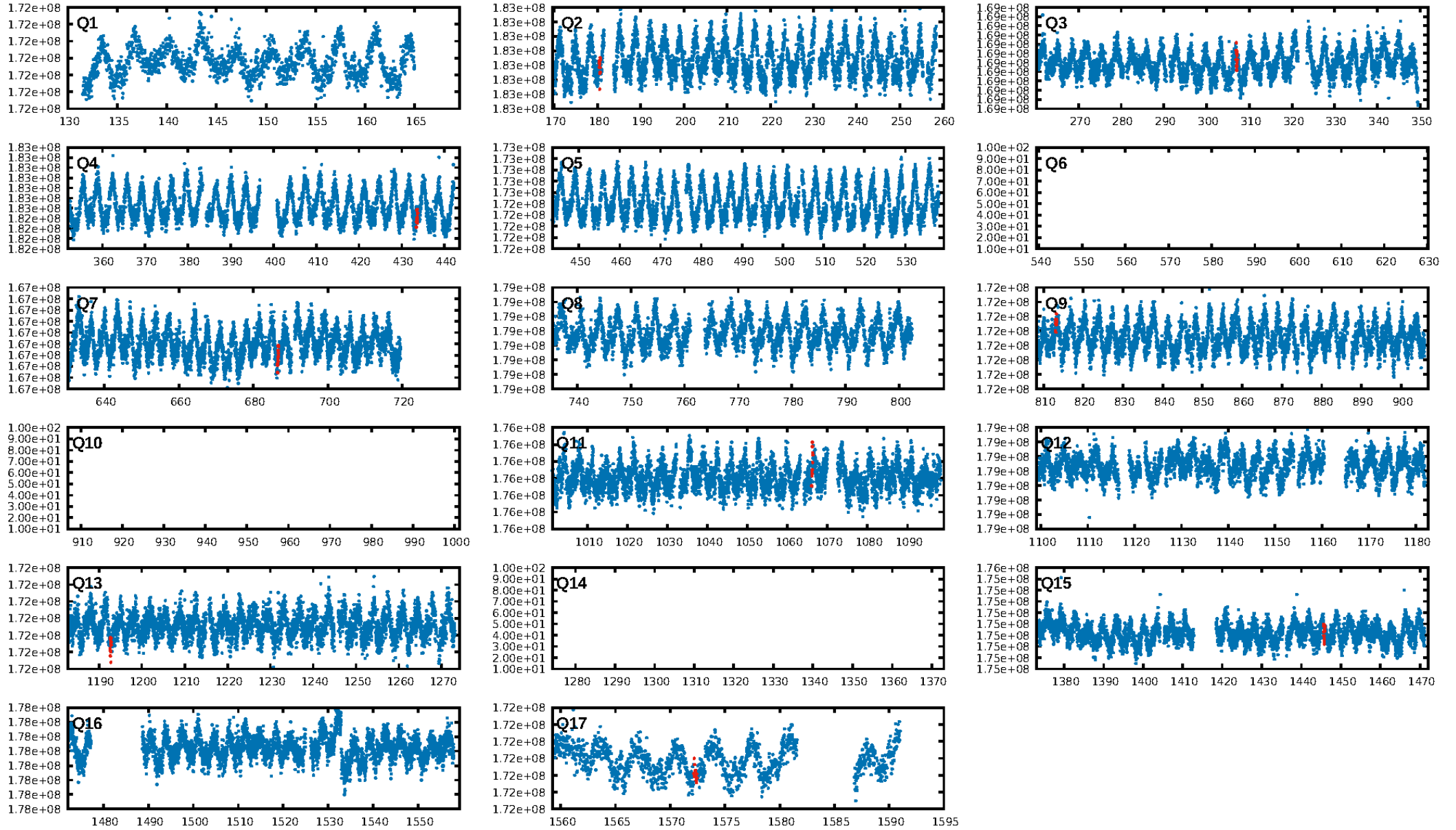
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [196.31σ]  
LongPeriod-sig: 100.0% [100.72σ]  
ModelChiSquare2-sig: 46.4%  
ModelChiSquareGof-sig: 88.1%  
**Bootstrap-pfa: 4.23e-12**  
RollingBand-fgt: 1.00 [3/3]  
**GhostDiagnostic-chr: 0.3408**  
Centroid-sig: 25.6%  
Centroid-so: 0.691 arcsec [1.07σ]  
OotOffset-rm: 1.101 arcsec [1.70σ]  
KicOffset-rm: 0.987 arcsec [1.46σ]  
OotOffset-st: 0/2/1/2 [5]  
KicOffset-st: 0/2/1/2 [5]  
DiffImageQuality-fgm: 0.60 [3/5]  
DiffImageOverlap-fno: 0.25 [2/8]

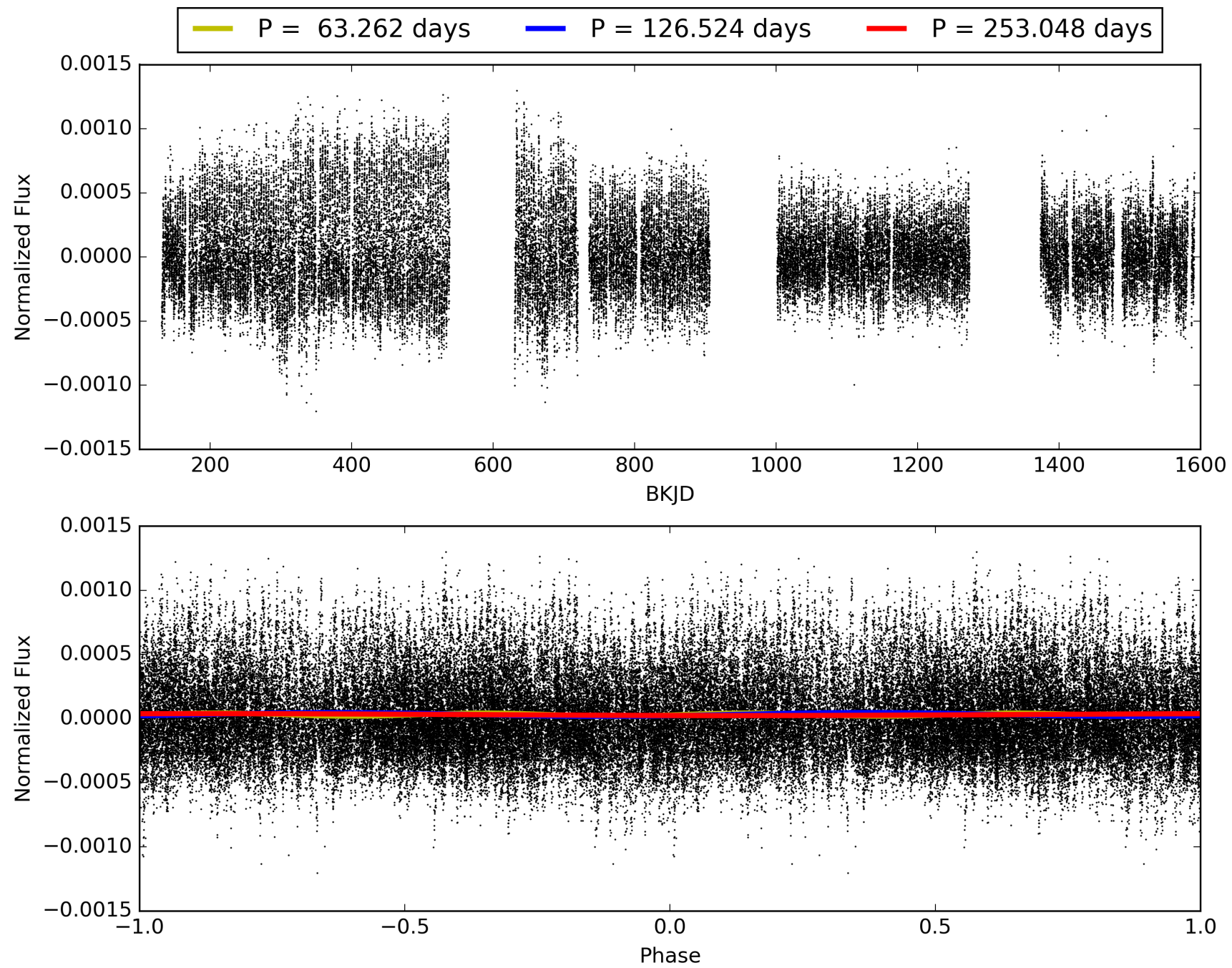
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 13:10:21 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 003247616-05, PDC Light Curves



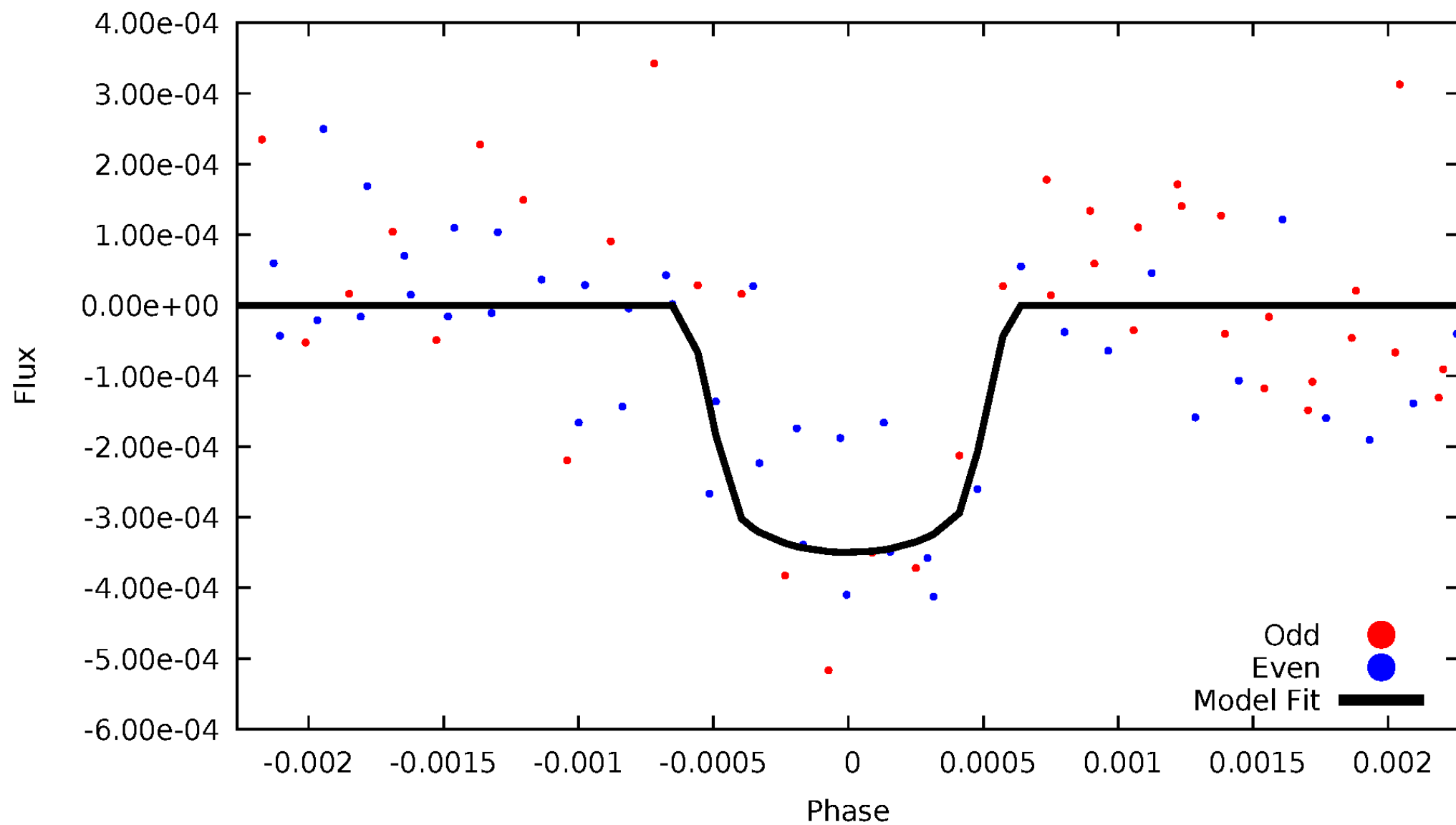
# TCE 003247616-05





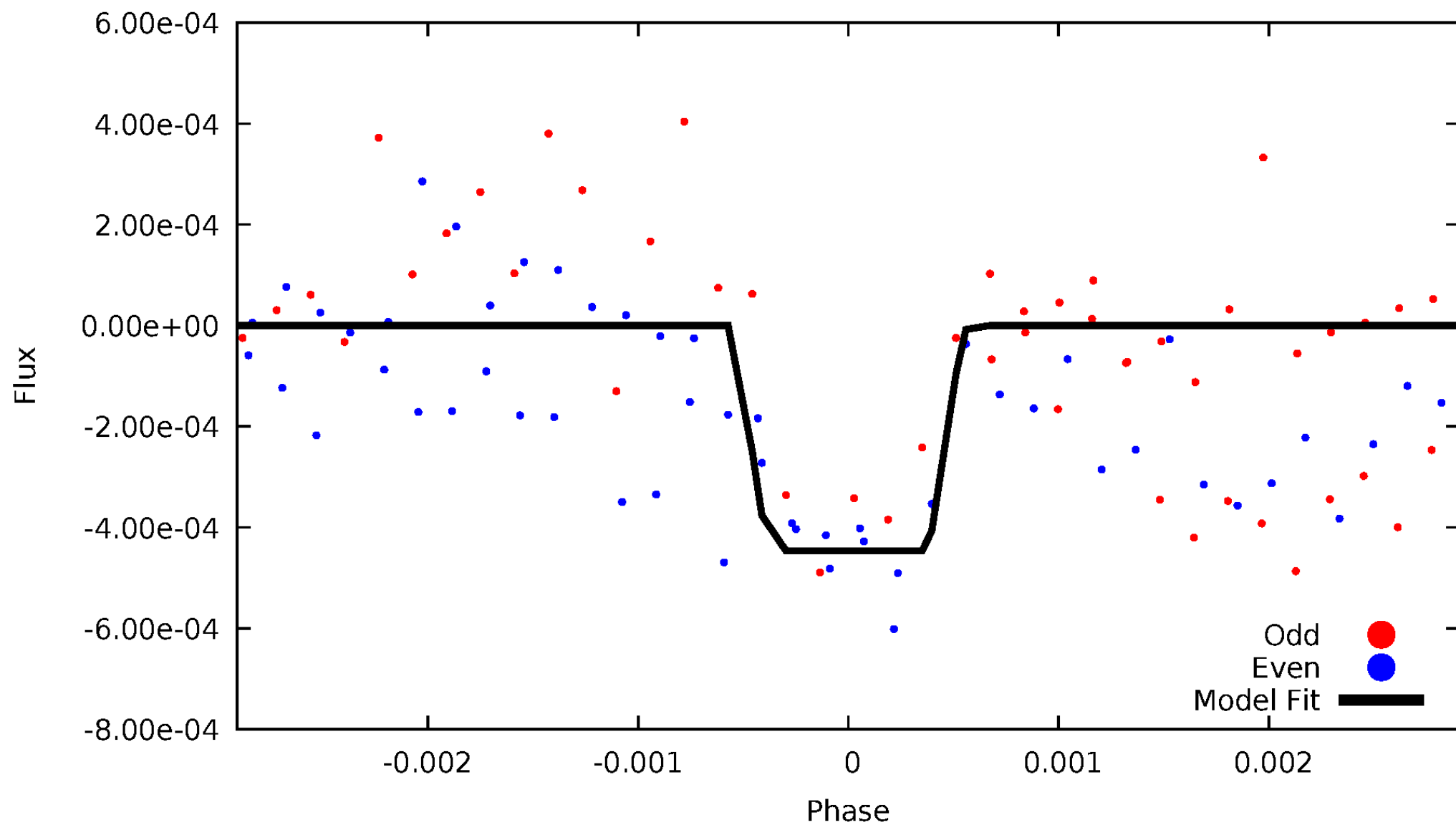
# DV Odd/Even

TCE 003247616-05



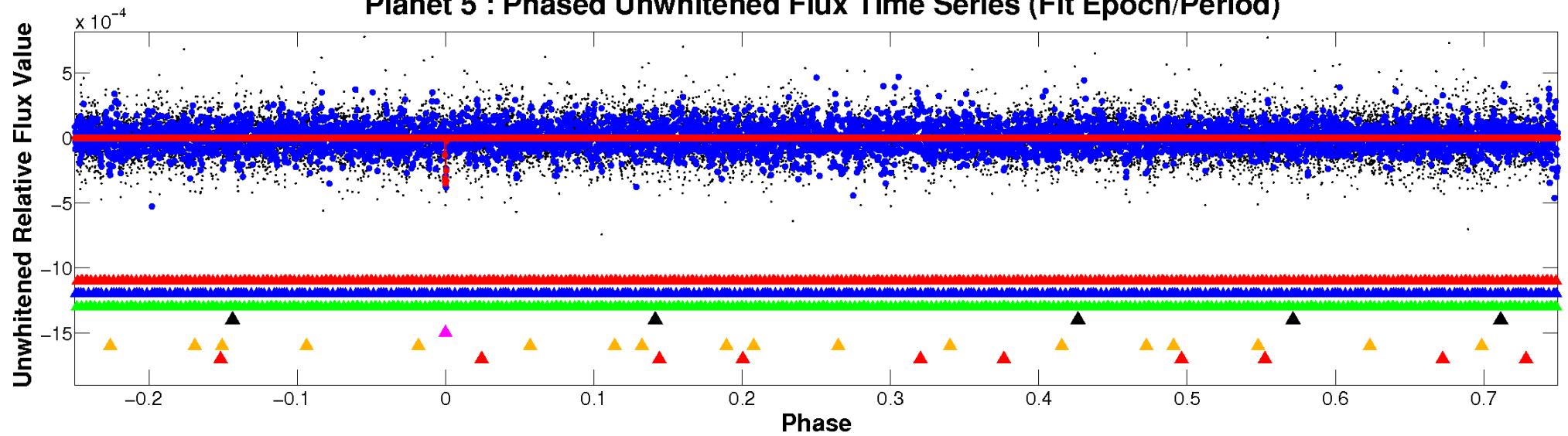
# ALT Odd/Even

TCE 003247616-05

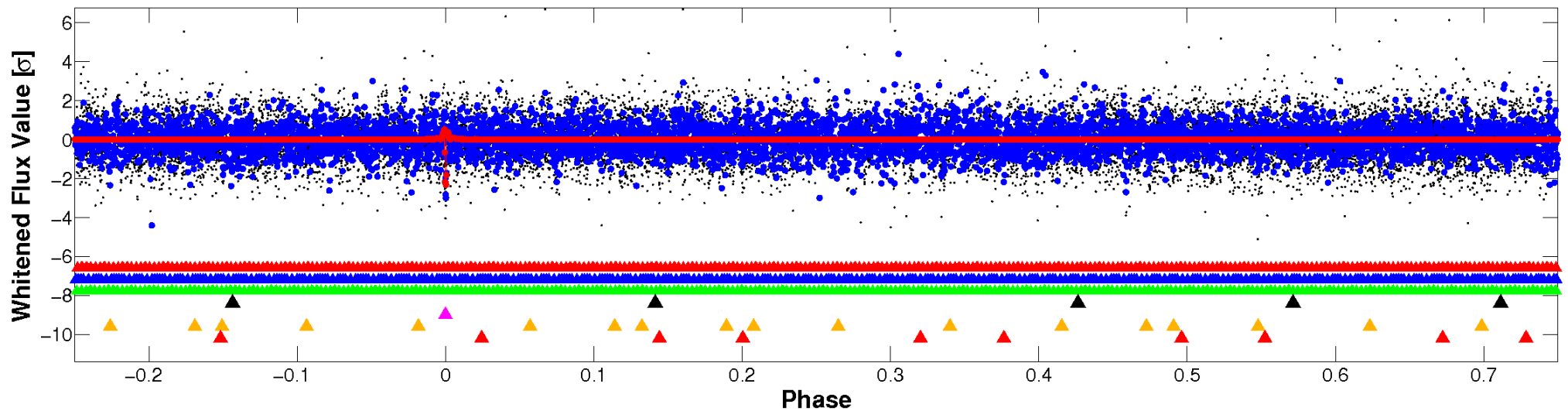


# Non-Whitened Vs. Whitened Light Curve

## Planet 5 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

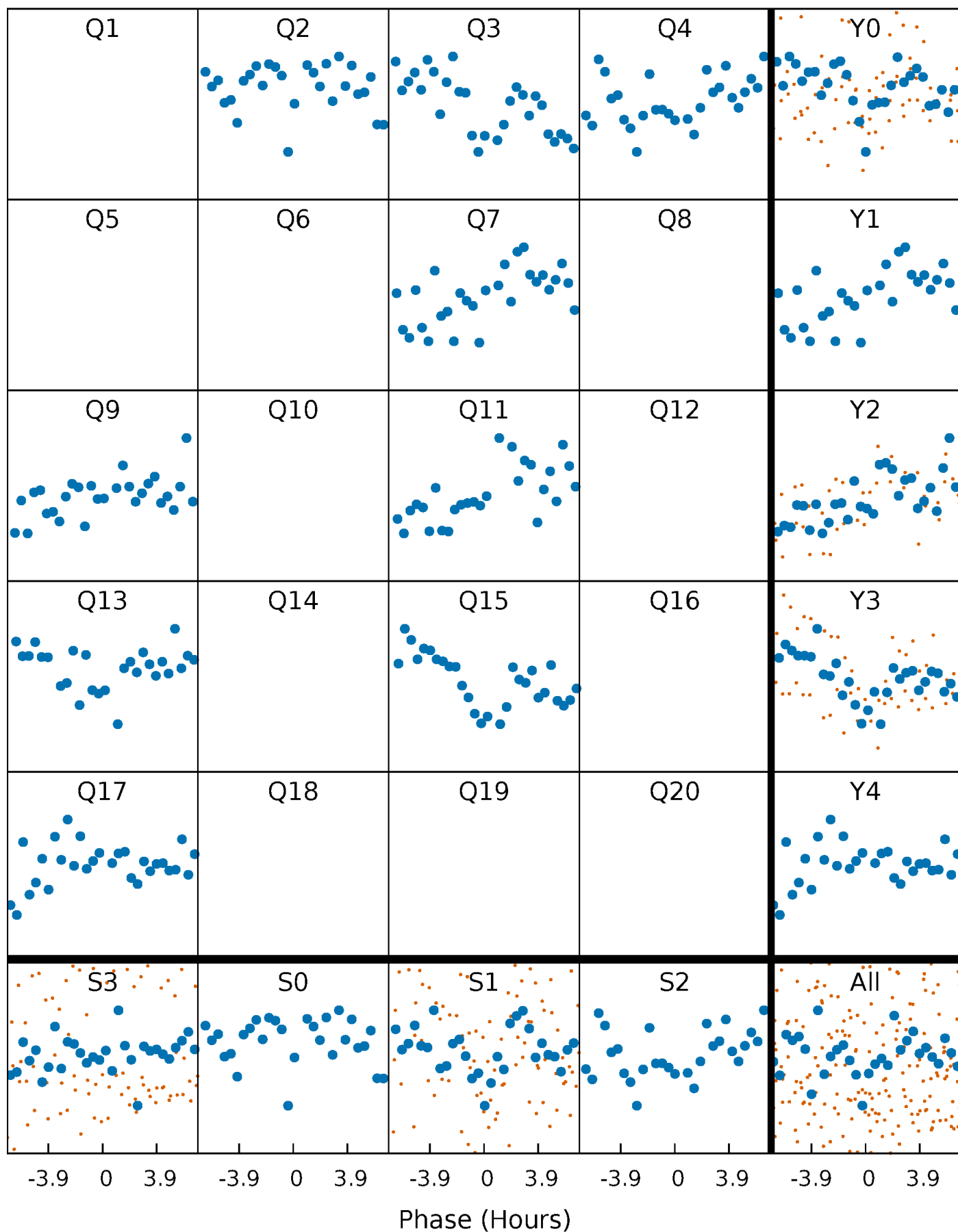


## Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



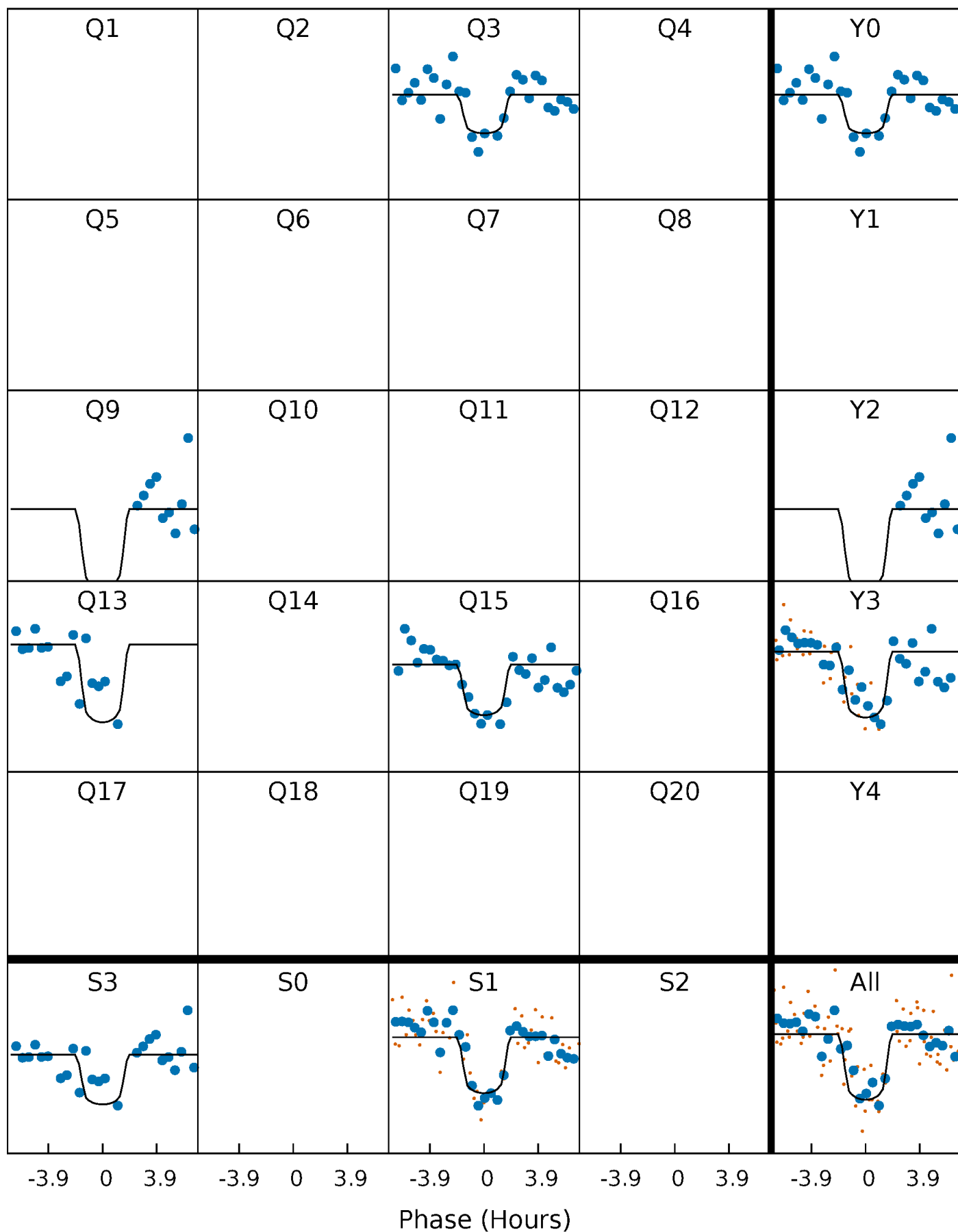
# PDC Quarter-Phased Transit Curves

TCE 003247616-05     $P=126.523774$  Days     $T_0=180.521913$  (BKJD)



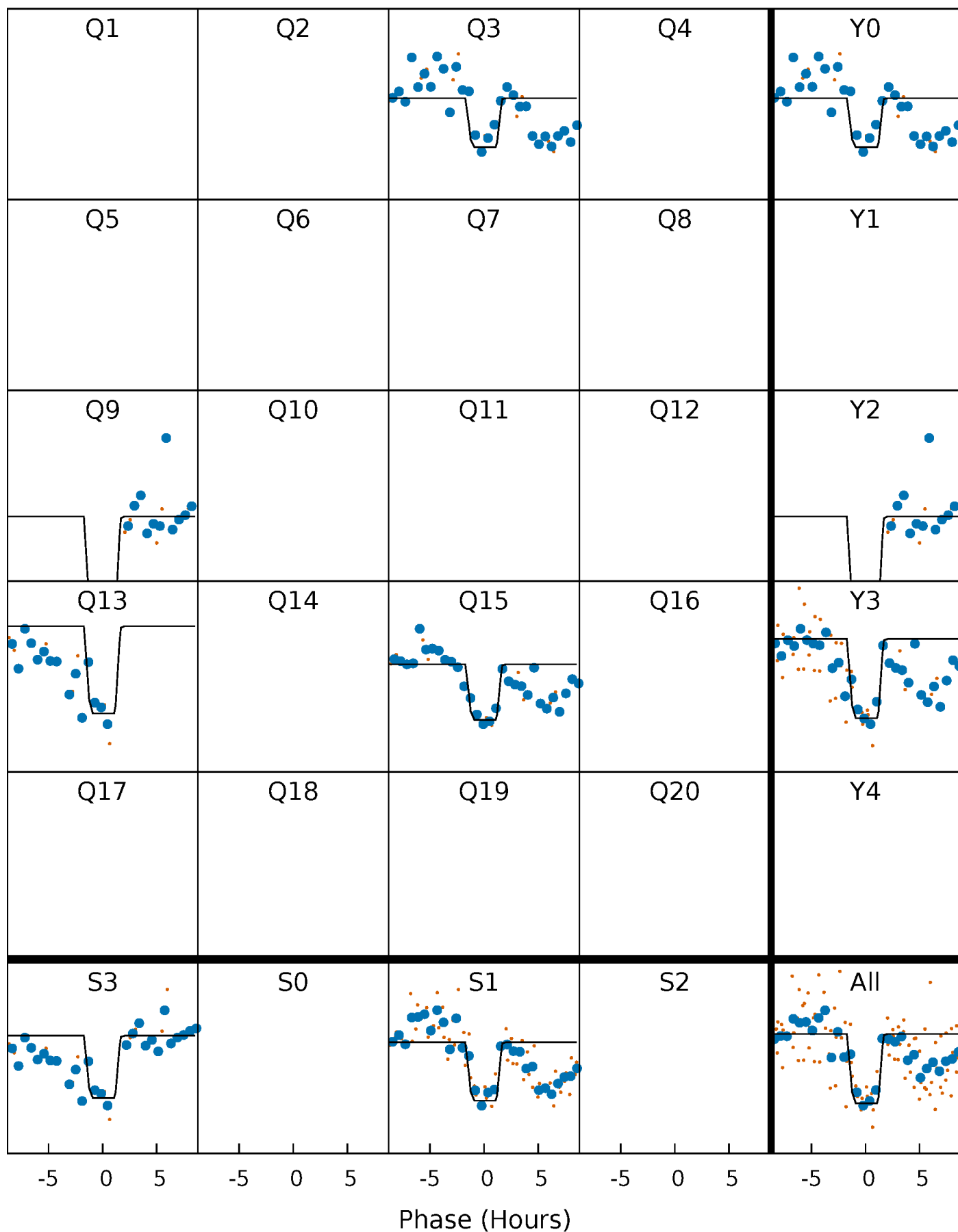
# DV Quarter-Phased Transit Curves

TCE 003247616-05     $P=126.523774$  Days     $T_0=180.521913$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

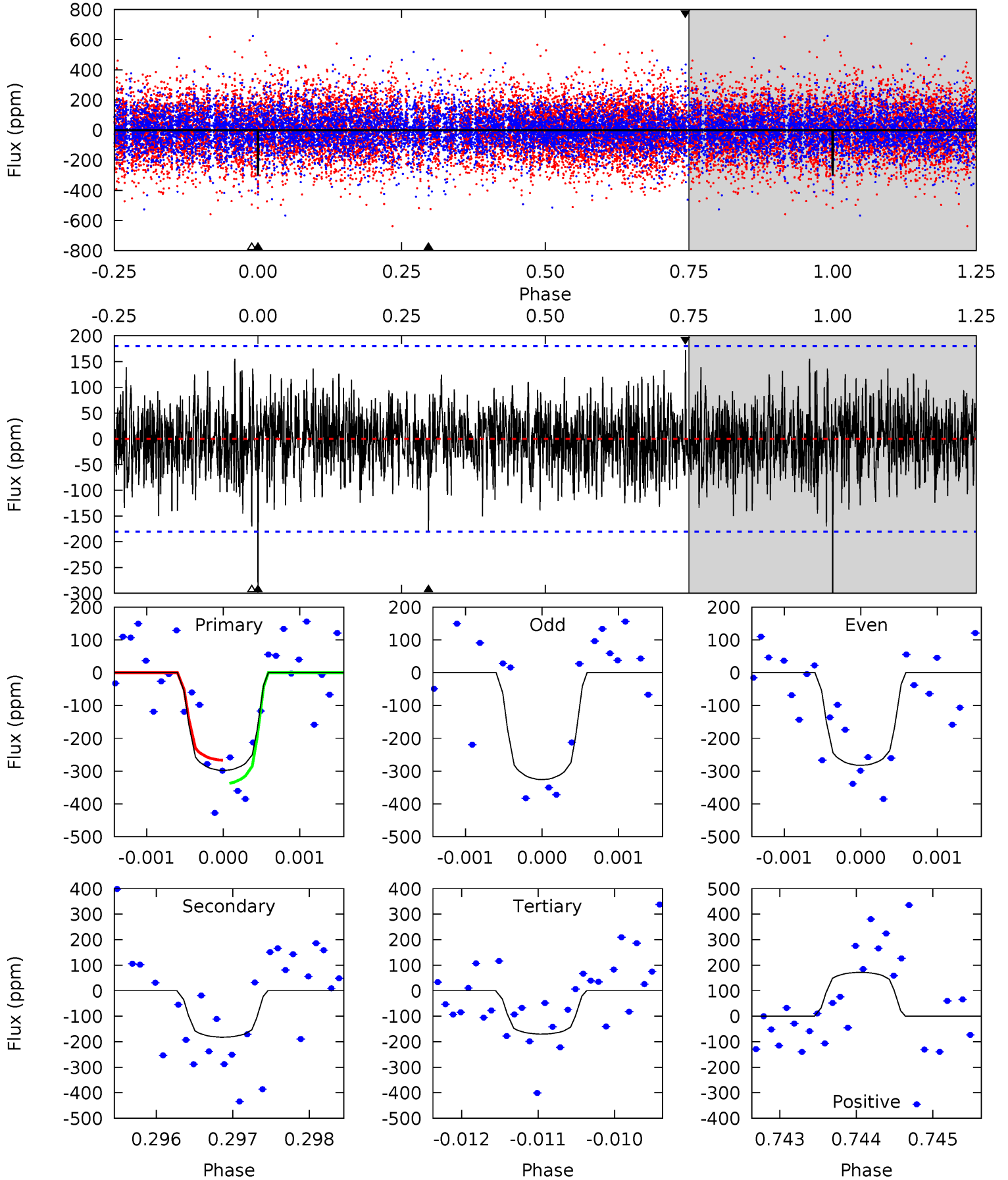
TCE 003247616-05 P=126.524061 Days  $T_0=180.529327$  (BKJD)



# DV Model-Shift Uniqueness Test

003247616-05,  $P = 126.523774$  Days,  $E = 53.998139$  Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.98	5.49	5.13	5.18	5.44	3.27	1.44	3.85	3.80	0.36	0.31	0.62	0.90	0.37	1.06

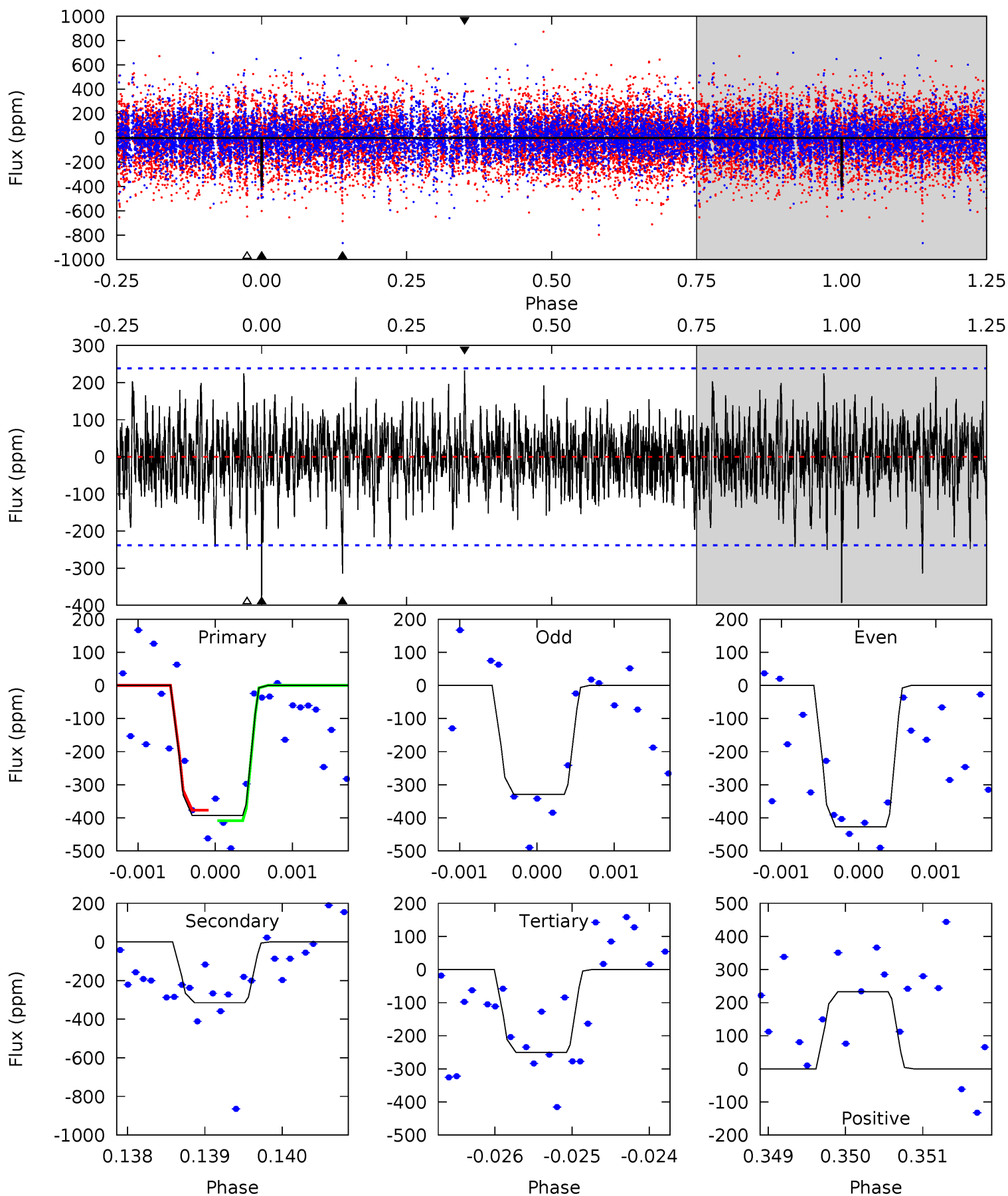




# Alt Model-Shift Uniqueness Test

003247616-05, P = 126.524061 Days, E = 54.005266 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.00	7.20	5.74	5.32	5.45	3.29	1.47	3.26	3.68	1.47	1.88	1.10	0.93	0.37	0.36



### Stellar Parameters For KIC 003247616

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6915^{+187}_{-229}$	$3.665^{+0.315}_{-0.074}$	$-0.220^{+0.300}_{-0.250}$	$3.127^{+0.390}_{-1.091}$	$1.651^{+0.208}_{-0.312}$	$0.076^{+0.155}_{-0.018}$
	+3%/-3%	+9%/-2%	+136%/-114%	+12%/-35%	+13%/-19%	+204%/-24%
Source	PHO1	FLK73	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 003247616-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-182 \pm 33$	$6.85^{+4.48}_{-3.94}$	$963^{+52}_{-82}$	$5421^{+3116}_{-1004}$	$729^{+3501}_{-472}$
Alt.	$-315 \pm 44$	$6.78^{+5.58}_{-3.73}$	$960^{+57}_{-78}$	$6135^{+4289}_{-1389}$	$1245^{+5614}_{-857}$

$T_{\text{max}}$  = Theoretical Maximum Planetary Temperature  
 $T_{\text{obs}}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )  
 $A_{\text{obs}}$  = Observed Albedo (Assuming  $T=0$ )

If a secondary eclipse is present, the system is likely an EB if  $T_{\text{obs}} \gg T_{\text{max}}$  AND  $A_{\text{obs}} \gg 1.0$

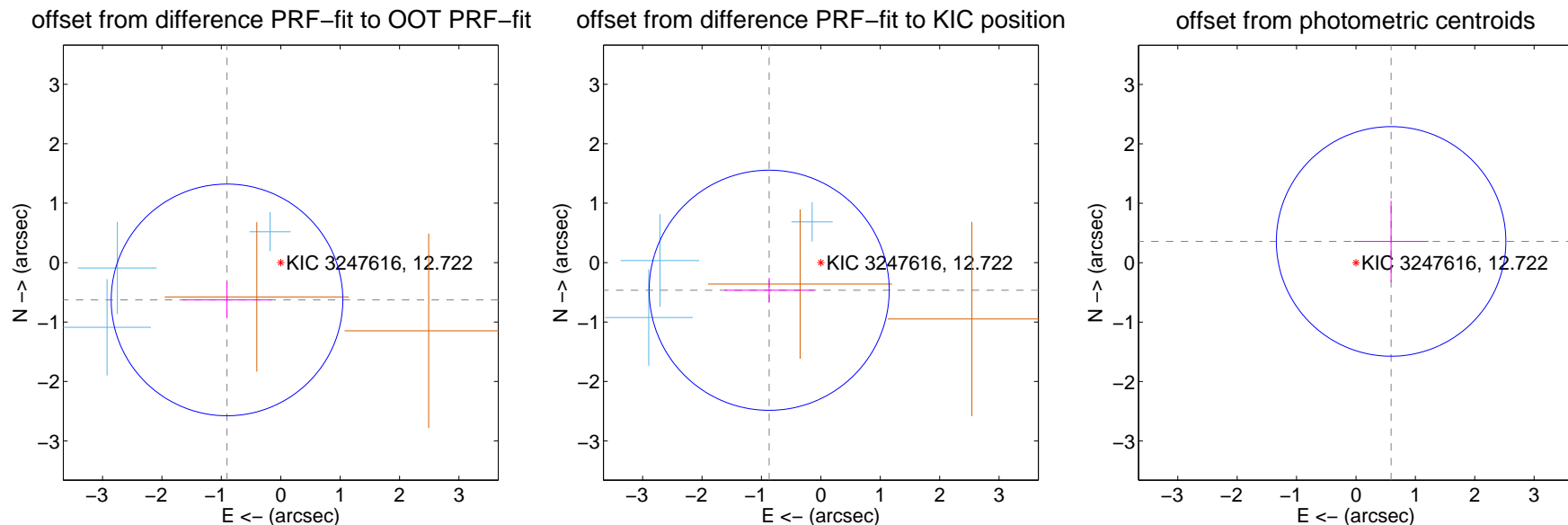
## DV Centroid Data

Supplemental centroid analysis for 003247616-05. Kepler magnitude: 12.72. Transit SNR 9.08

There are 3 quarters with good PRF difference image offsets

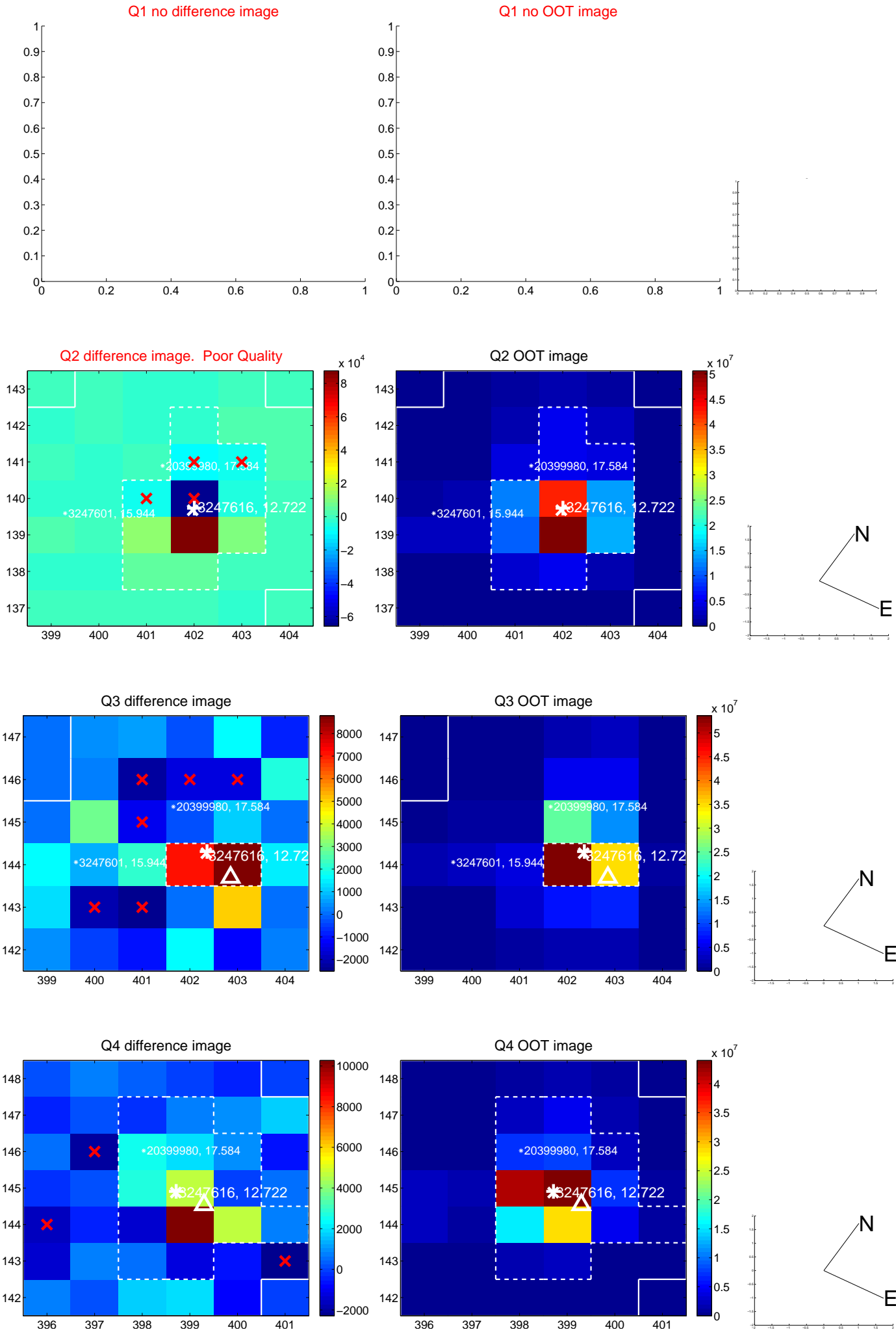
The direct PRF centroid is offset from the target star catalog position by about 0.22 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.101 \pm 0.650$	1.70	$0.905 \pm 0.754$	$-0.628 \pm 0.308$
PRF-fit source offset from KIC position	$0.987 \pm 0.674$	1.46	$0.870 \pm 0.756$	$-0.466 \pm 0.209$
photometric centroid source offset	$0.69 \pm 0.64$	1.07	$-0.59 \pm 0.63$	$0.36 \pm 0.68$

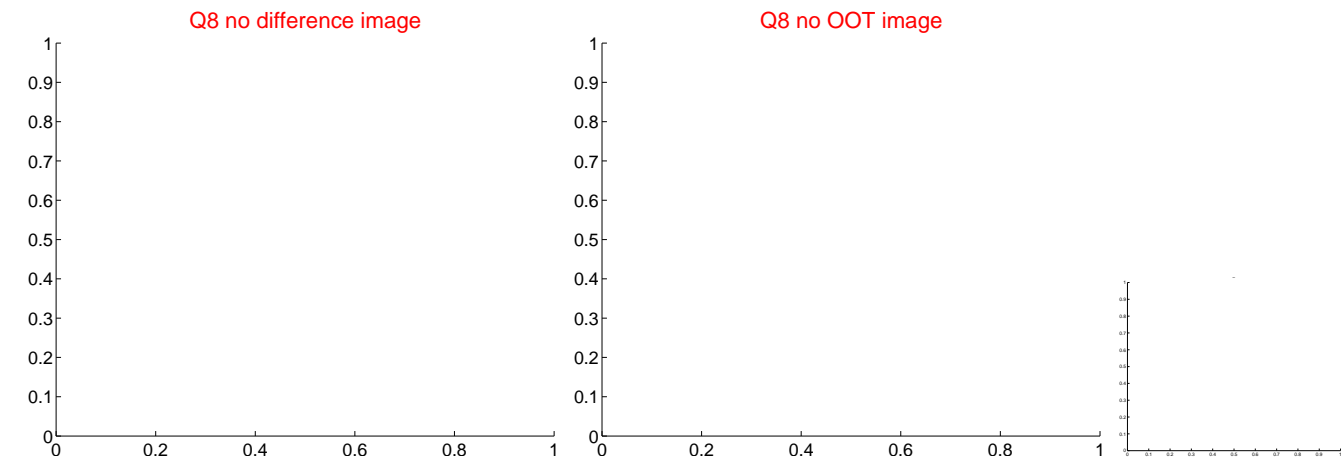
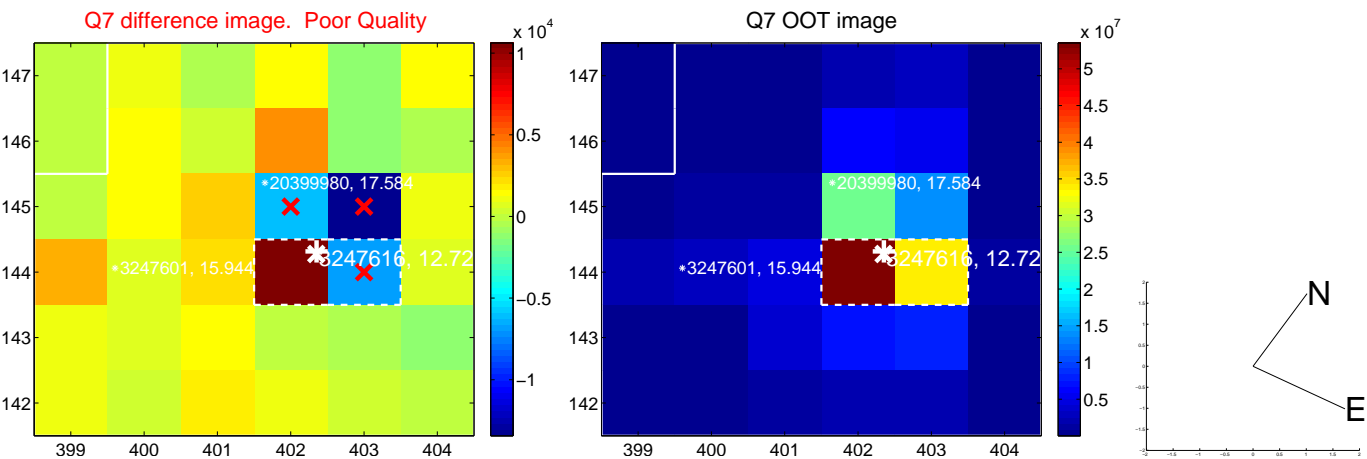
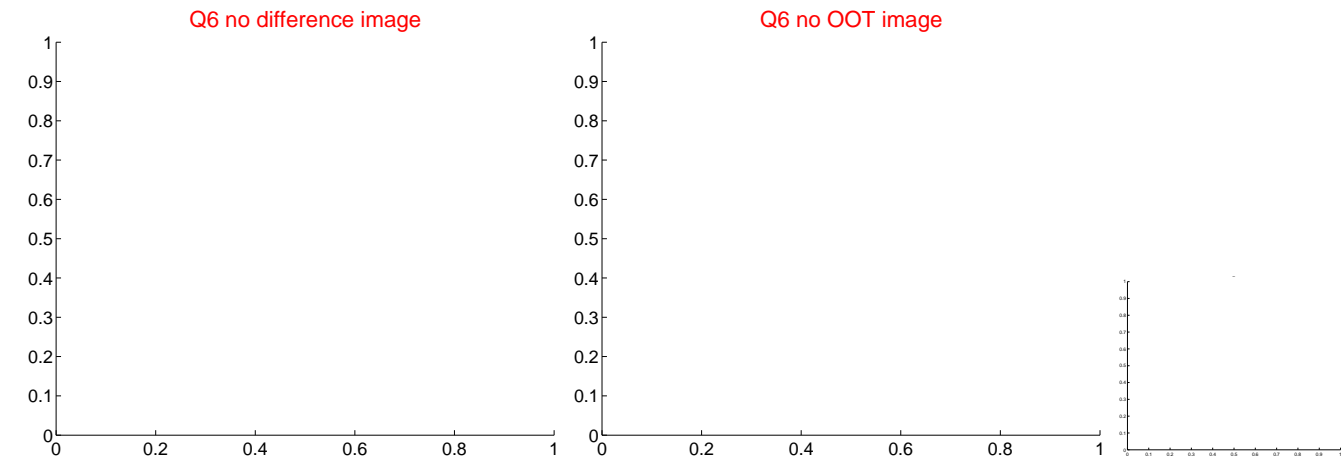


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

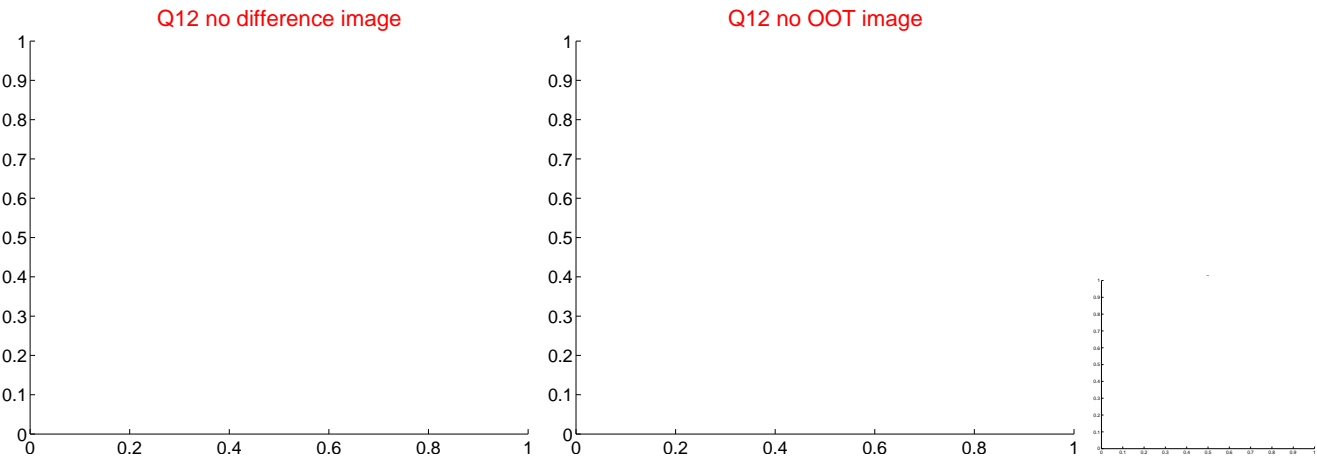
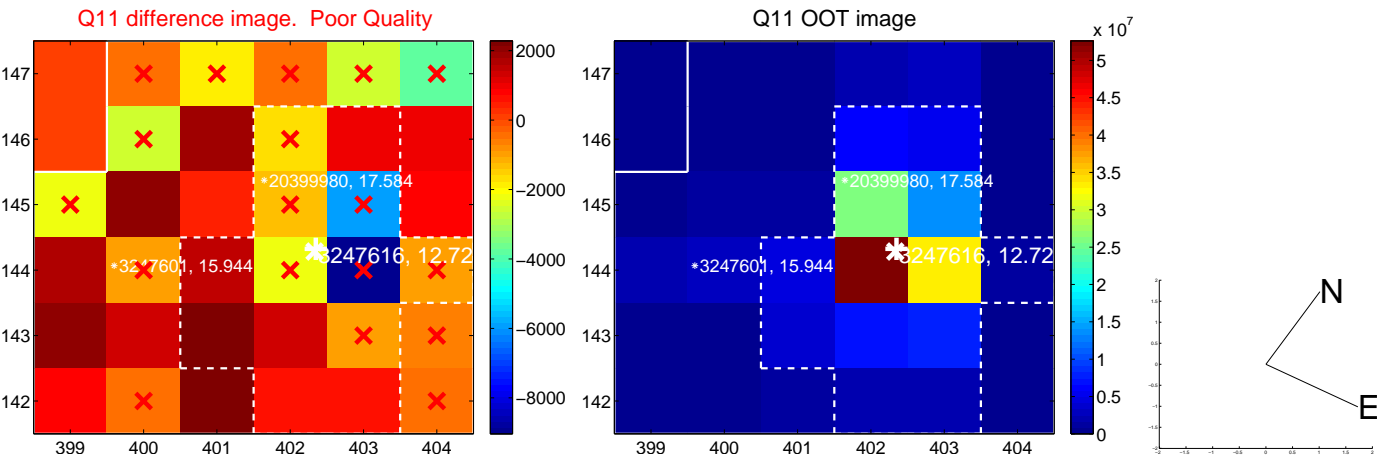
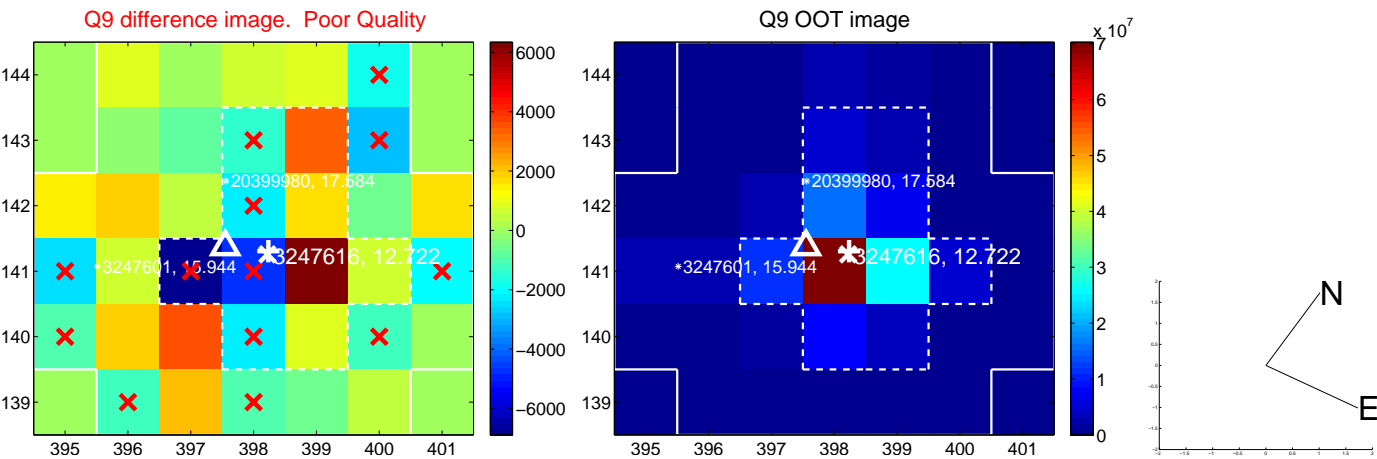
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

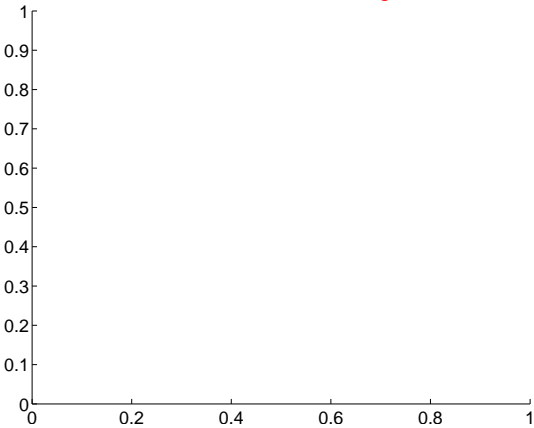


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

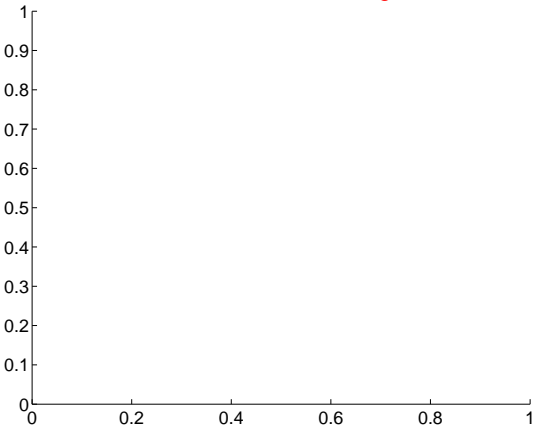
Q13 no difference image



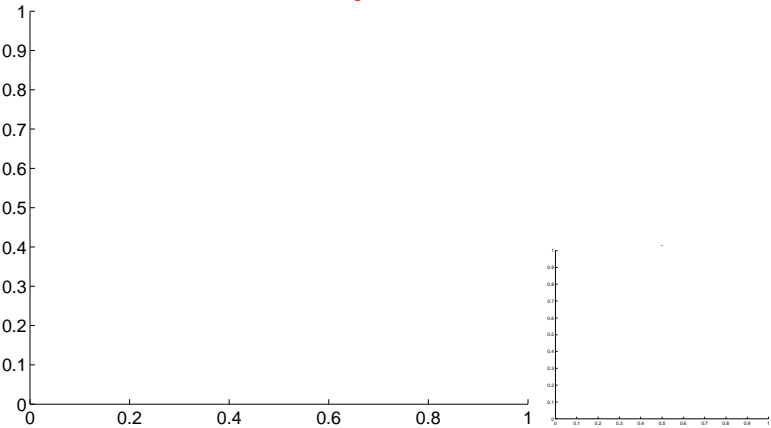
Q13 no OOT image



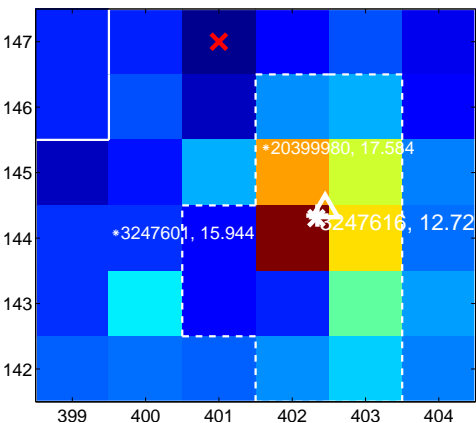
Q14 no difference image



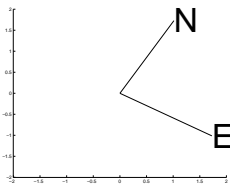
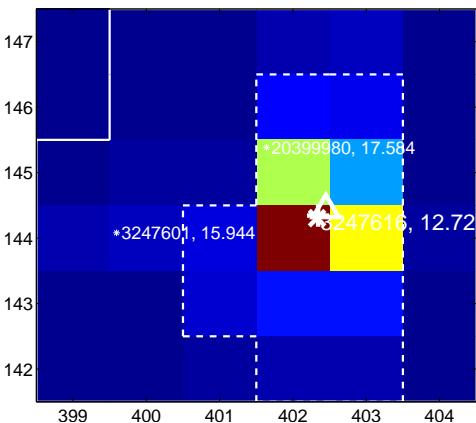
Q14 no OOT image



Q15 difference image



Q15 OOT image



Q16 no difference image

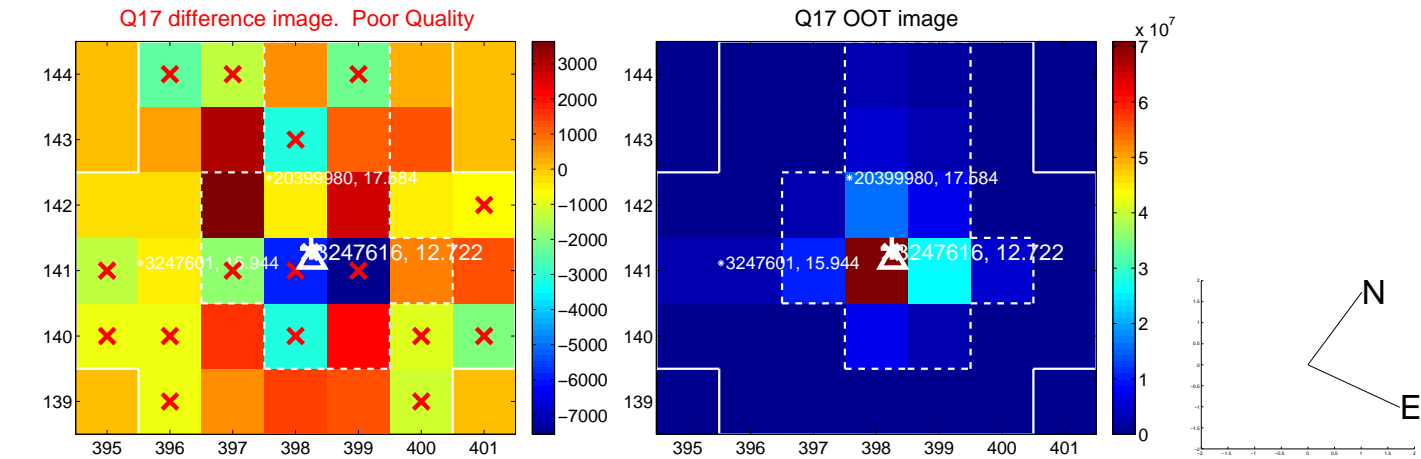


Q16 no OOT image

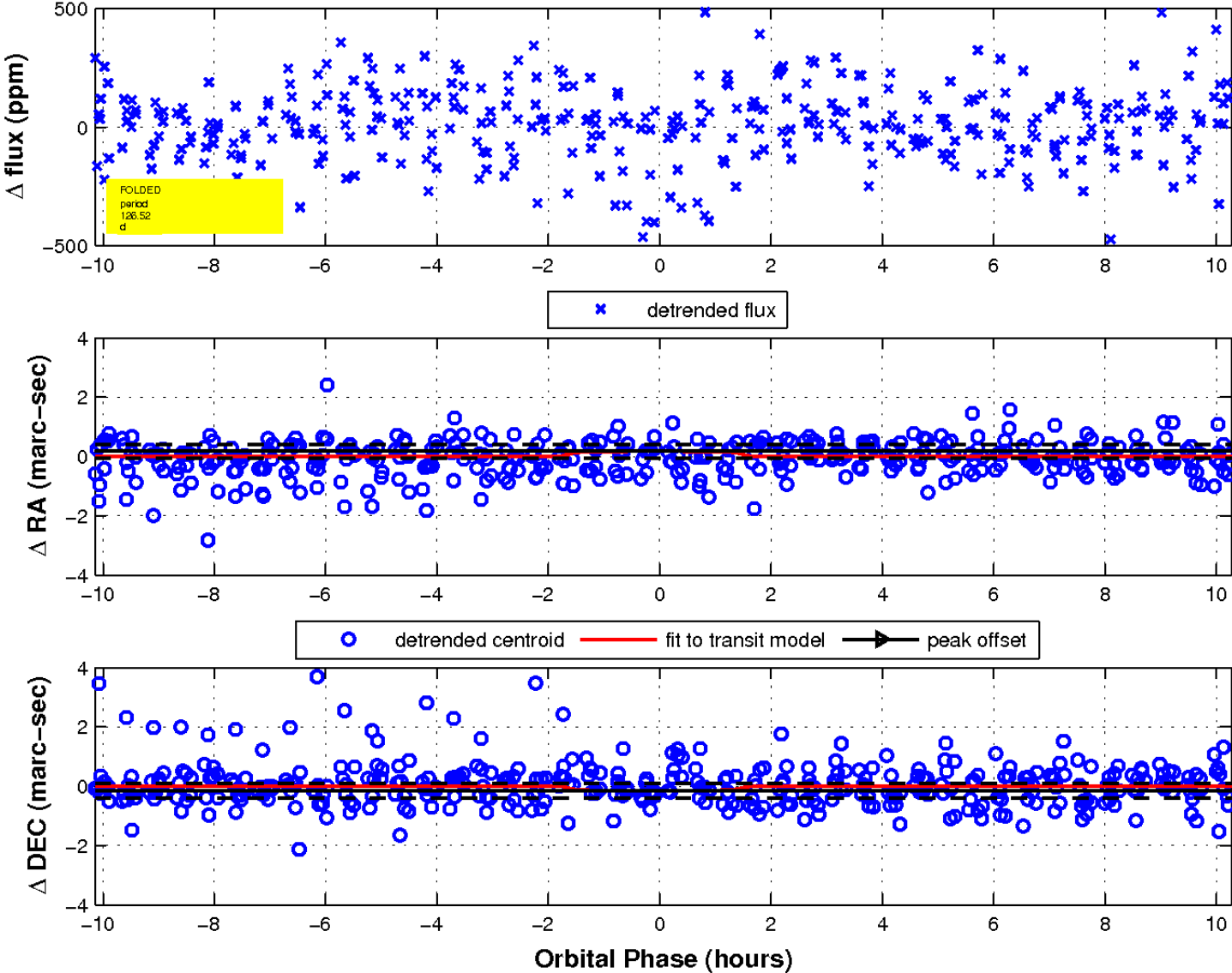




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

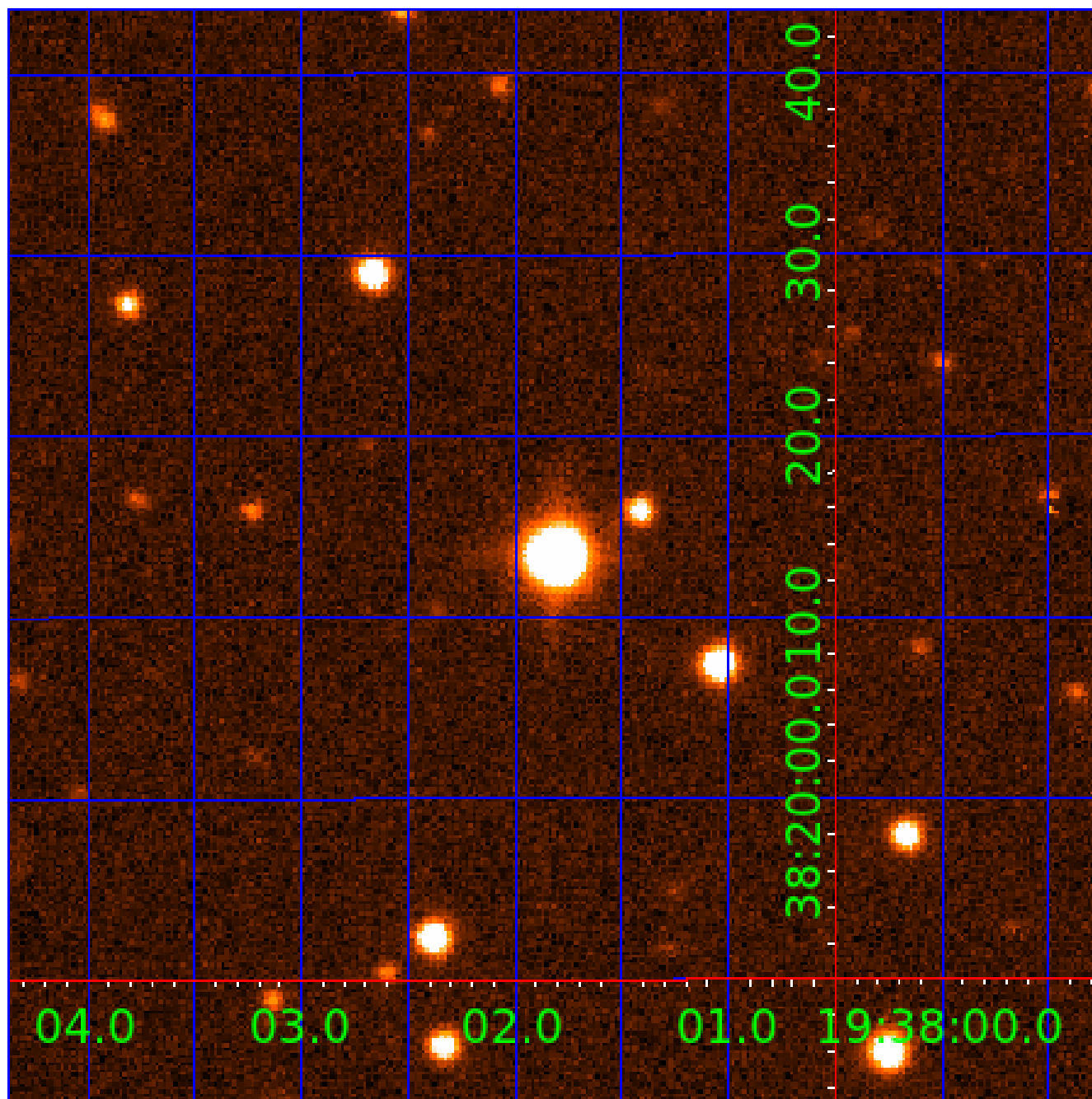


fluxWeightedCentroids, Planet 5 of 7



UKIRT Image

Declination



# KIC 003247616

## Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	$R_{\star}$ ( $R_{\odot}$ )	$T_{\star}$ (K)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003247616-01	OBS	No	3.471928	132.100191	70.7	9.800	12.2	14.5	3.13	6915	4.99	7123.95
003247616-02	OBS	No	3.472358	134.876085	0.0	6.691	10.0	0.0	3.13	6915	0.01	7122.77
003247616-03	OBS	No	3.471931	134.373317	32.8	8.764	8.9	9.3	3.13	6915	2.22	7123.94
003247616-04	OBS	No	289.107157	379.348536	246.4	21.063	11.6	7.5	3.13	6915	5.82	19.59
003247616-05	OBS	No	126.523774	180.521913	349.7	3.437	8.5	9.1	3.13	6915	6.71	58.96
003247616-06	OBS	No	81.171074	206.811883	195.3	4.351	7.5	7.3	3.13	6915	4.94	106.56
003247616-07	OBS	No	148.796891	198.768348	291.8	4.044	7.3	7.9	3.13	6915	7.04	47.50

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003247616-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV
003247616-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—SWEET_NTL—LPP_DV—SAME_NTL_PERIOD—CENT_FEW_DIFFS
003247616-03	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—SAME_NTL_PERIOD
003247616-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
003247616-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT
003247616-06	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
003247616-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

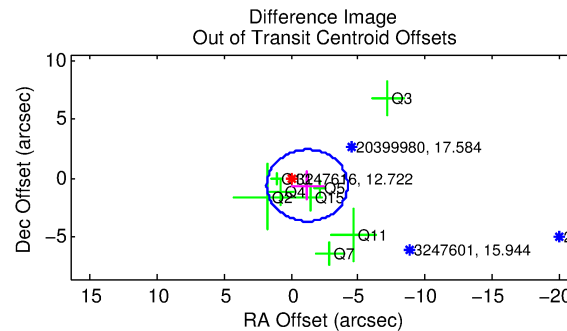
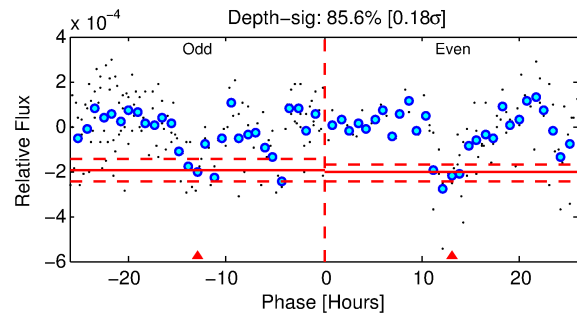
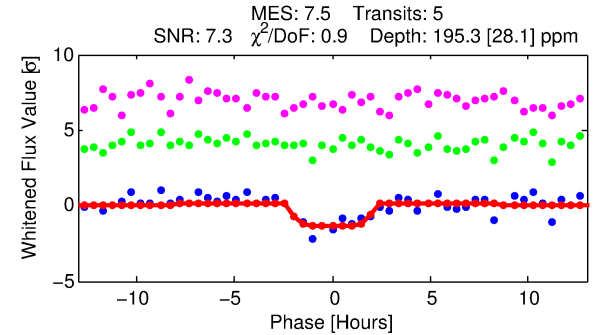
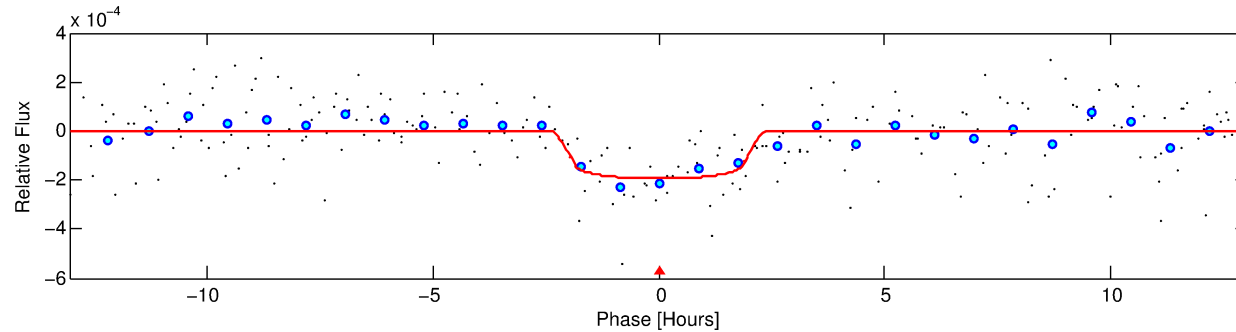
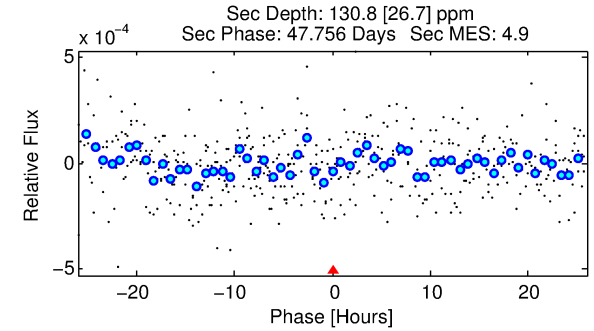
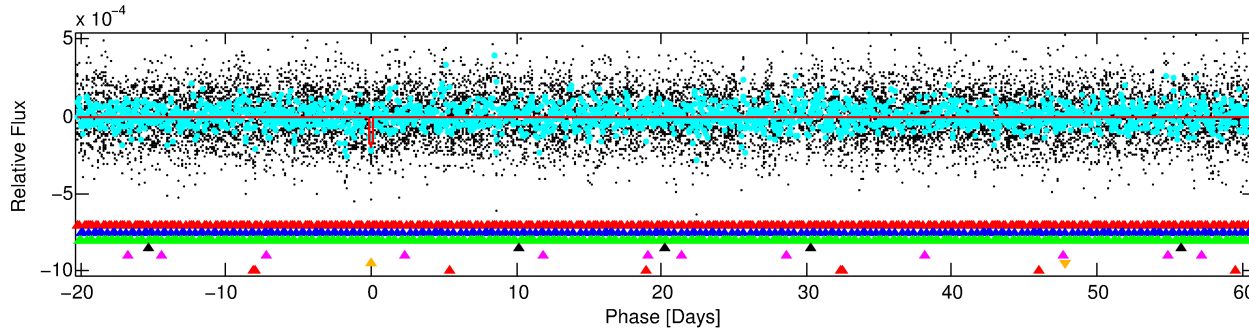
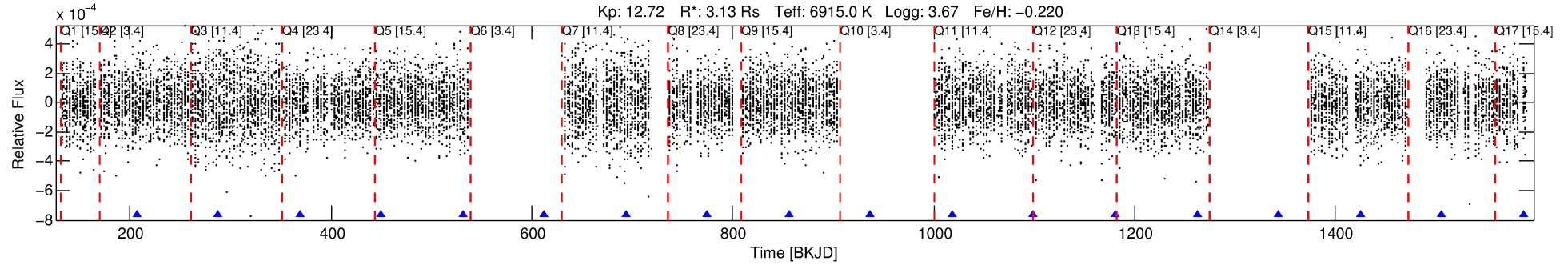
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 003247616-06

No Significant Match Found

# DV One-Page Summary

KIC: 3247616 Candidate: 6 of 7 Period: 81.171 d



## DV Fit Results:

Period = 81.17107 [0.00124] d  
Epoch = 206.8119 [0.0133] BKJD  
Rp/R\* = 0.0145 [0.0068]  
a/R\* = 77.67 [216.23]  
b = 0.86 [0.88]  
Seff = 106.56 [58.90]  
Teq = 819 [113] K  
Rp = 4.94 [2.90] Re  
a = 0.4336 [0.1455] AU  
Ag = 554.13 [611.95] [0.90 $\sigma$ ]  
Teffp = 6146 [1497] K [3.55 $\sigma$ ]

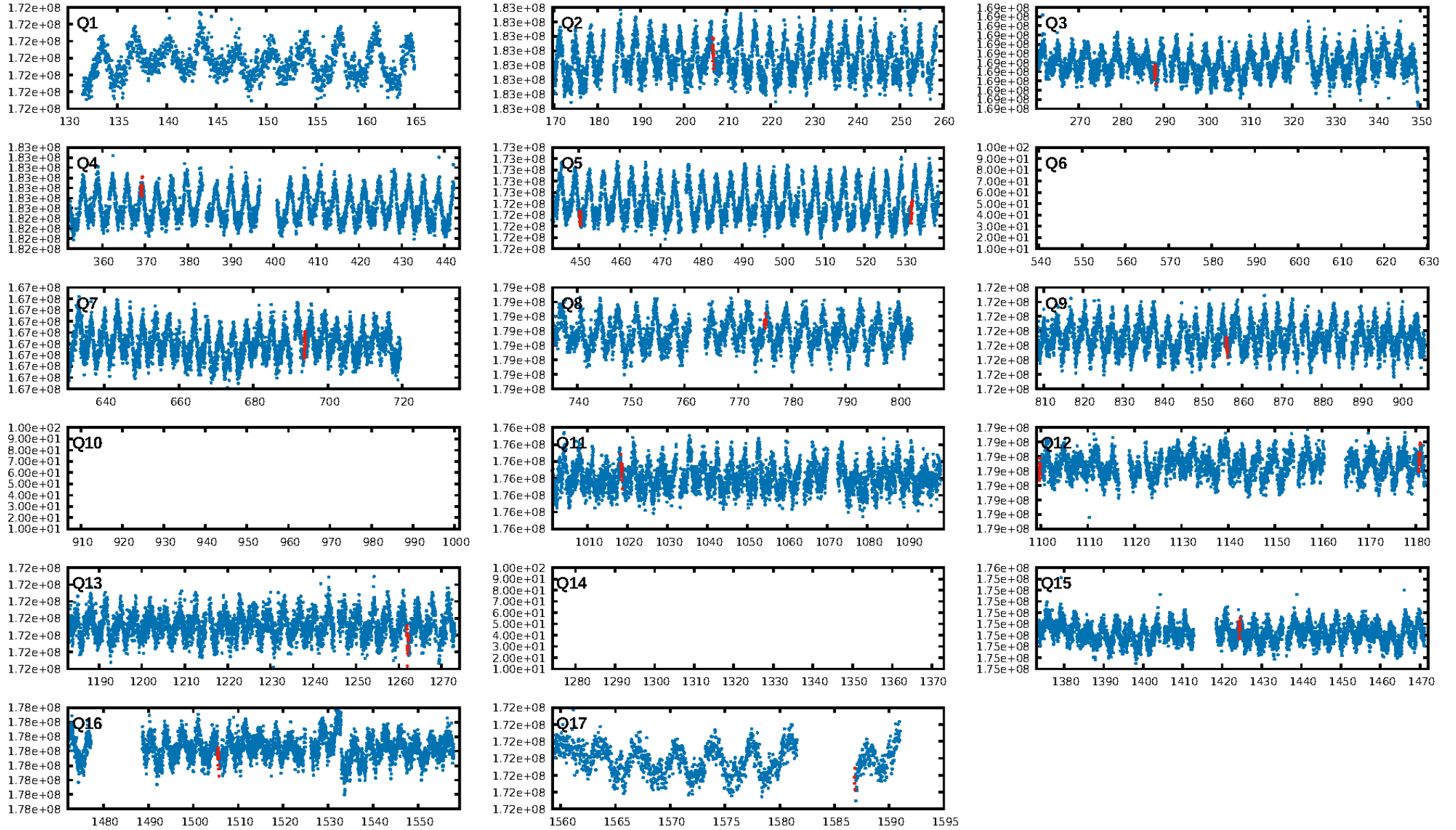
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [233.65 $\sigma$ ]  
LongPeriod-sig: 100.0% [196.31 $\sigma$ ]  
ModelChiSquare2-sig: 62.7%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 7.98e-09**  
RollingBand-fgt: 1.00 [5/5]  
GhostDiagnostic-chr: -9.523  
Centroid-sig: 0.4%  
Centroid-so: 1.526 arcsec [1.72 $\sigma$ ]  
OotOffset-rm: 1.325 arcsec [1.31 $\sigma$ ]  
KicOffset-rm: 1.321 arcsec [1.36 $\sigma$ ]  
OotOffset-st: 1/4/1/2 [8]  
KicOffset-st: 1/4/1/2 [8]  
DiffImageQuality-fgm: 0.50 [4/8]  
DiffImageOverlap-fno: 0.36 [4/11]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 13:10:25 Z

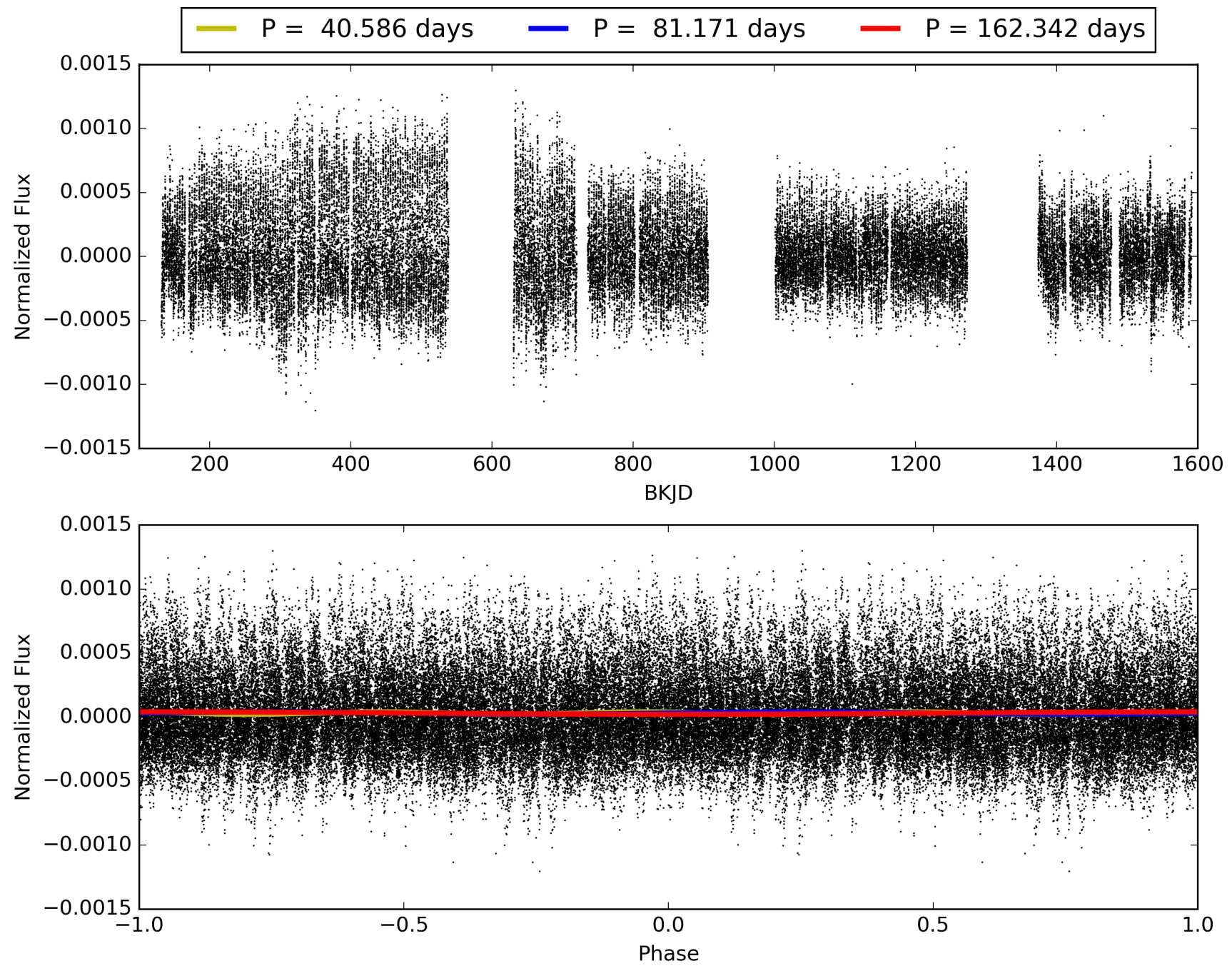
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 003247616-06, PDC Light Curves



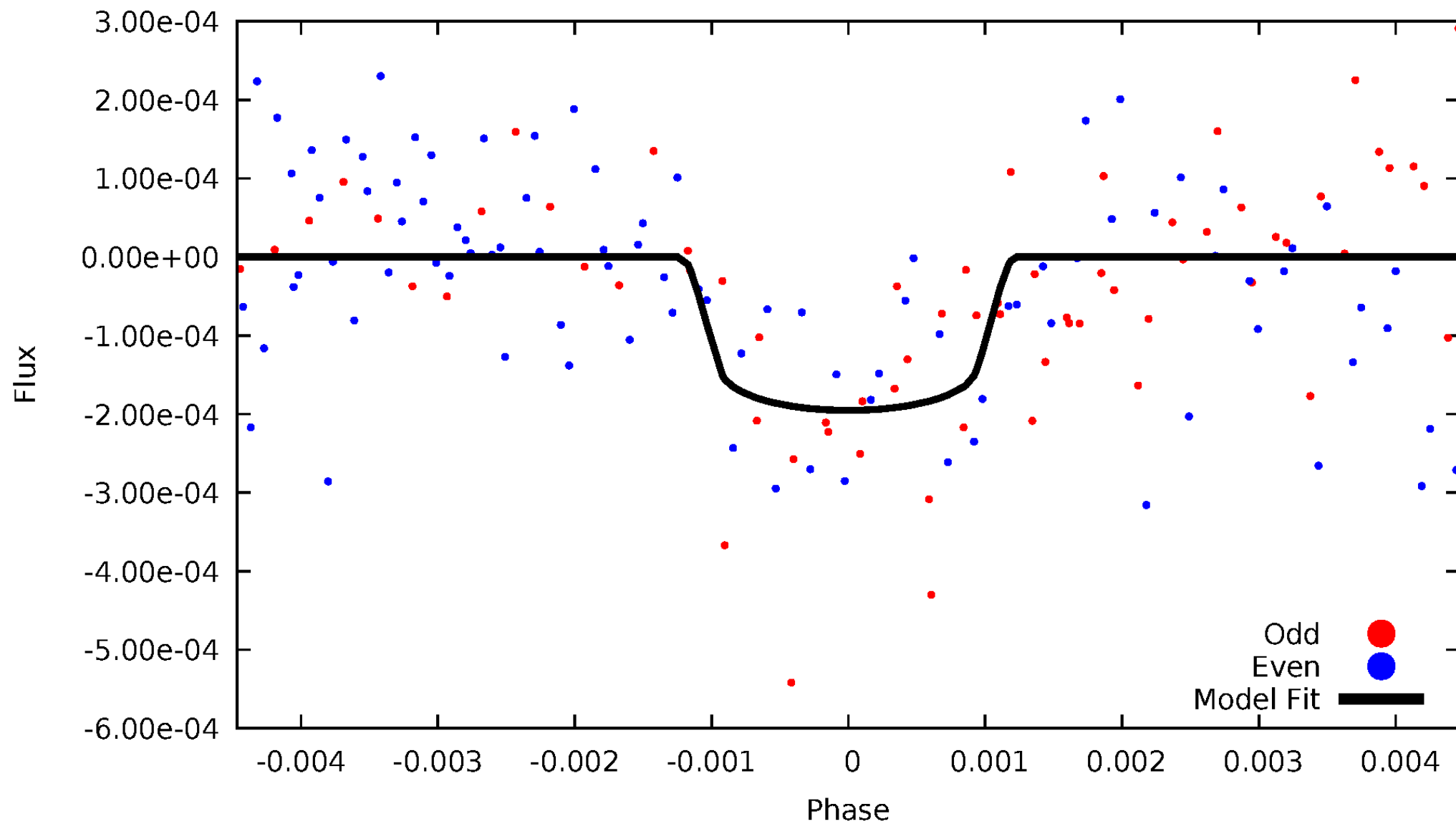


TCE 003247616-06



# DV Odd/Even

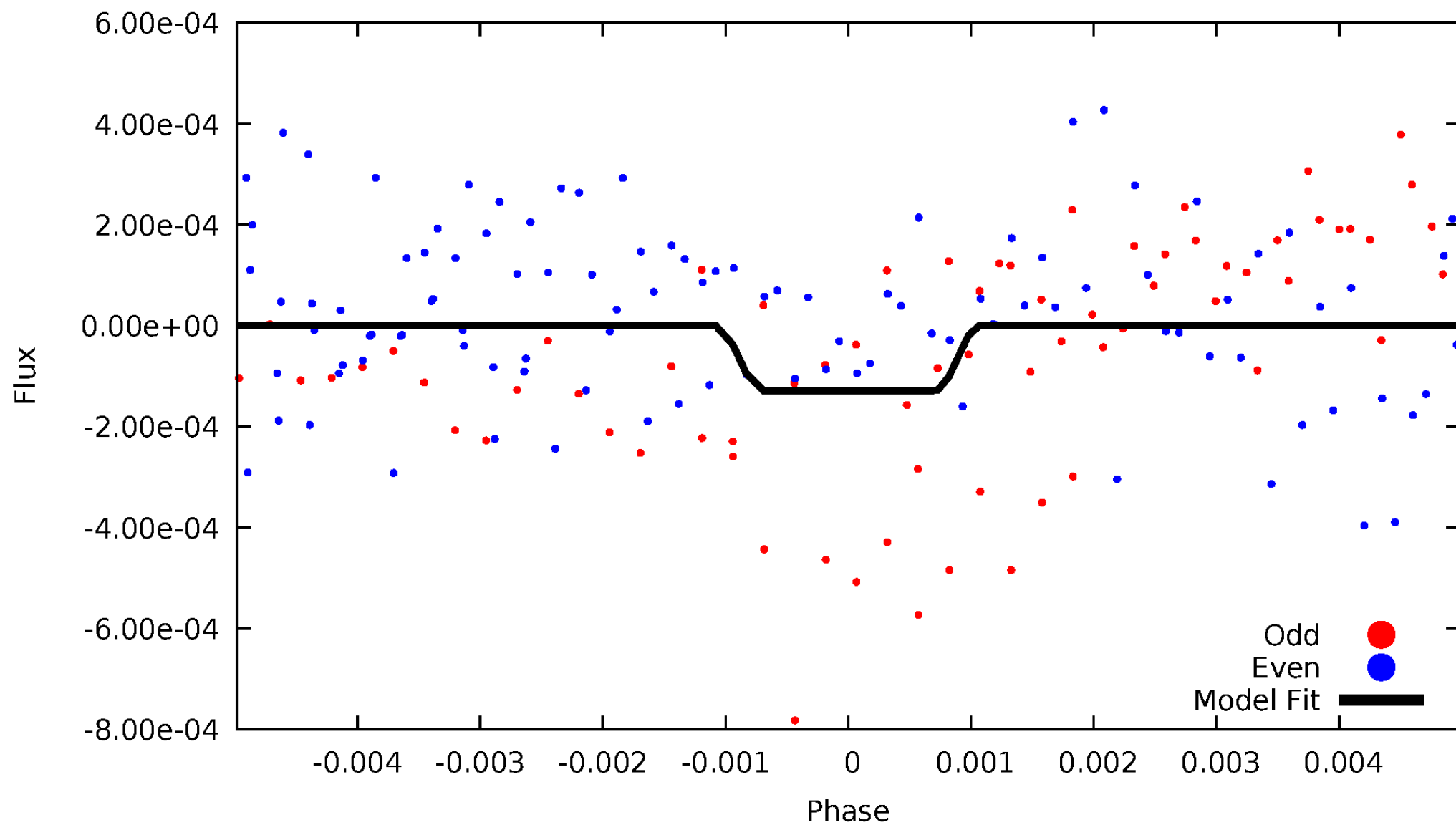
TCE 003247616-06





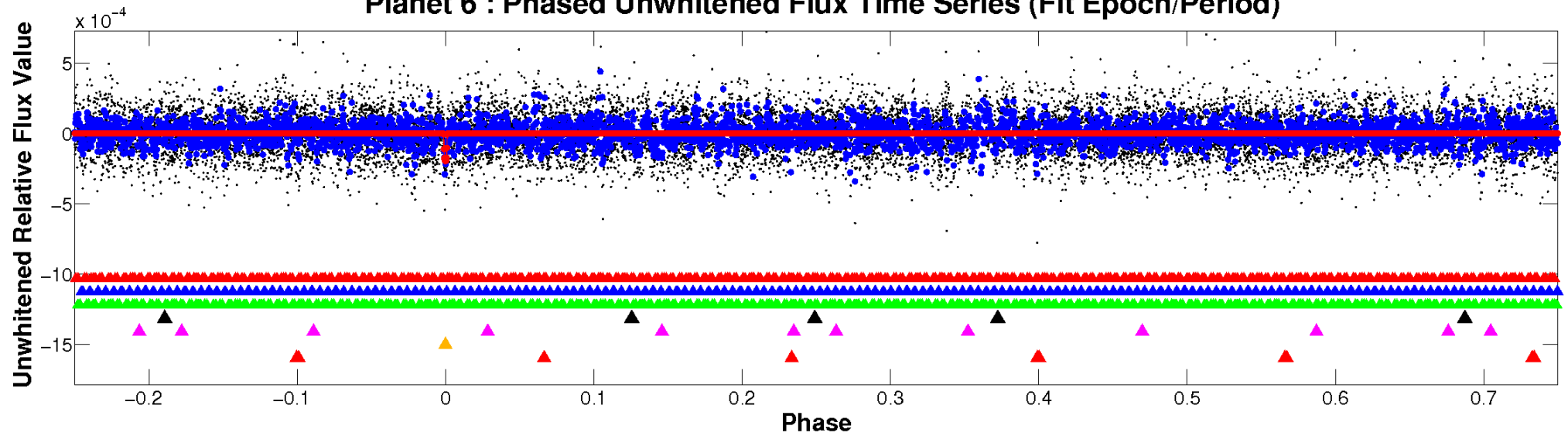
# ALT Odd/Even

TCE 003247616-06

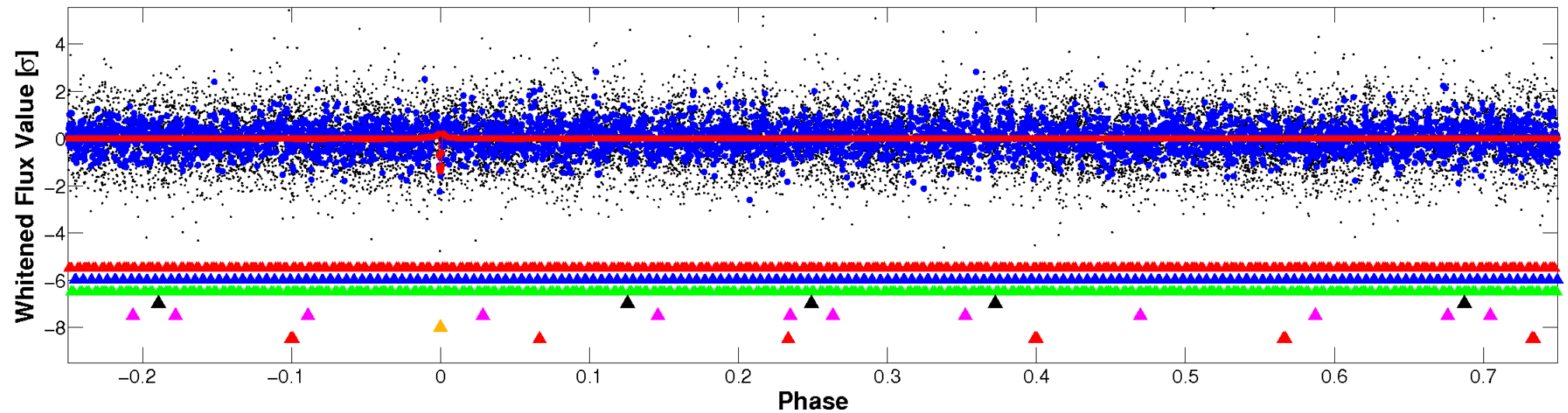


# Non-Whitened Vs. Whitened Light Curve

## Planet 6 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

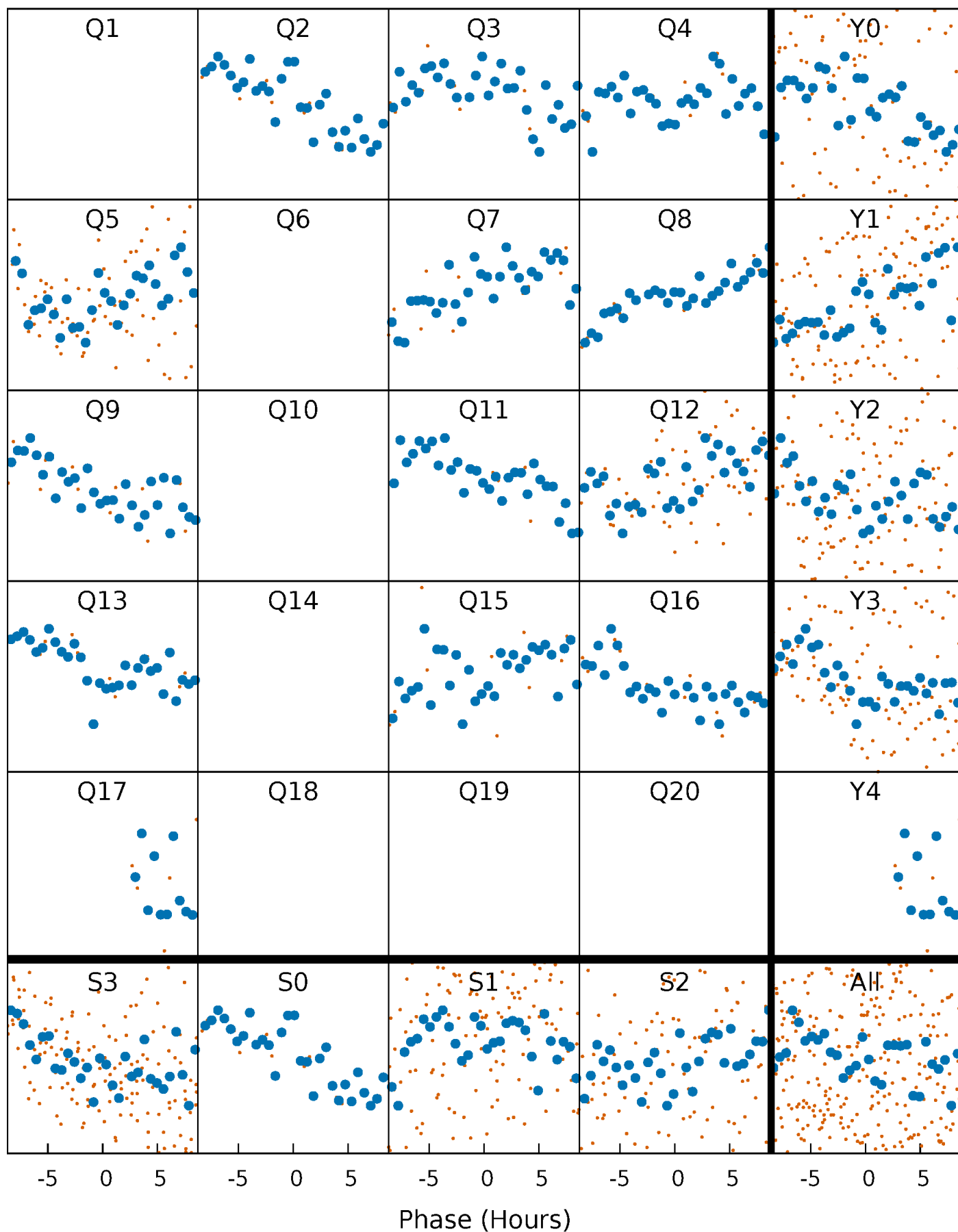


## Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



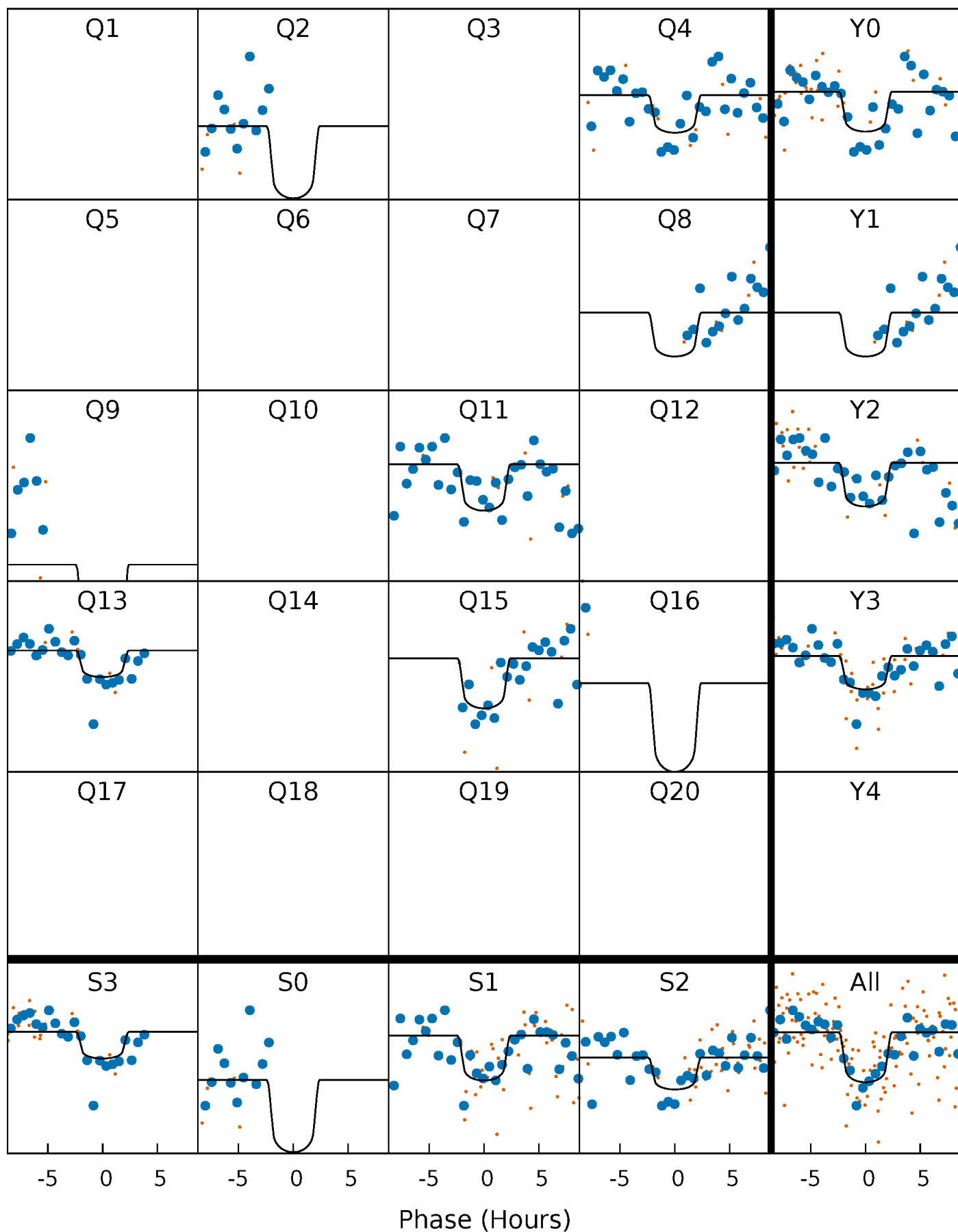
# PDC Quarter-Phased Transit Curves

TCE 003247616-06 P= 81.171074 Days  $T_0=206.811883$  (BKJD)



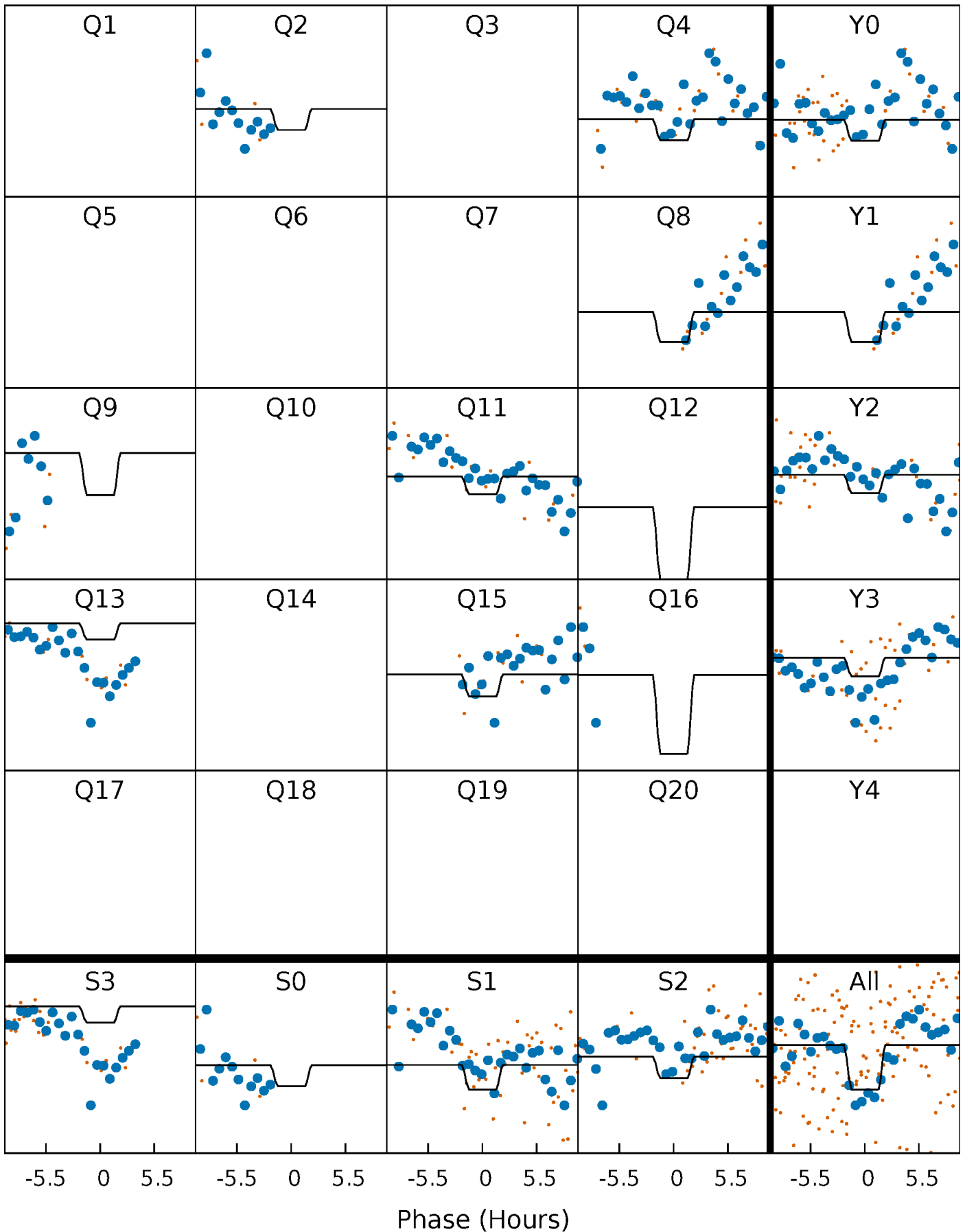
# DV Quarter-Phased Transit Curves

TCE 003247616-06   P= 81.171074 Days    $T_0=206.811883$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

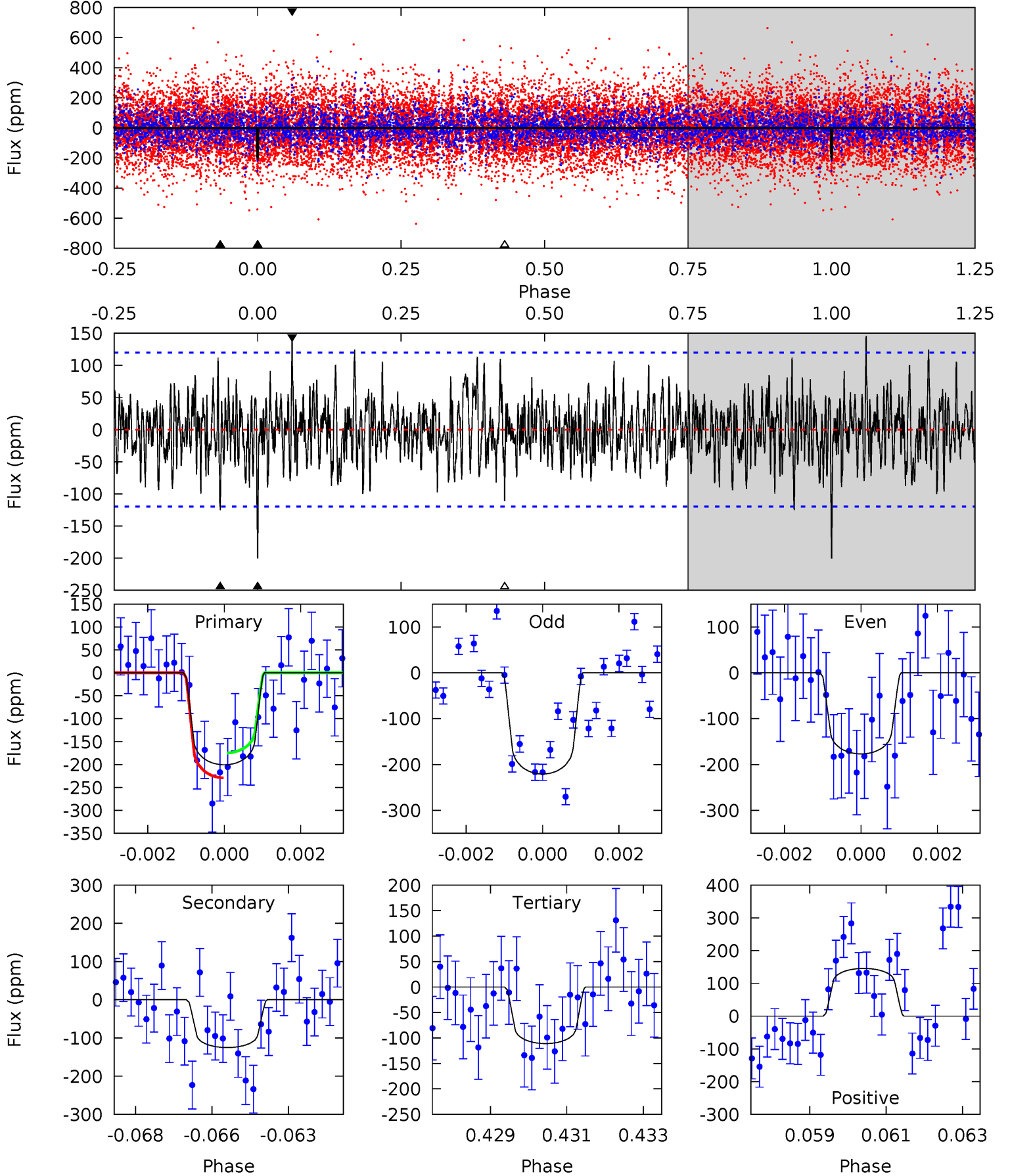
TCE 003247616-06     $P = 81.171933$  Days     $T_0 = 206.802257$  (BKJD)



# DV Model-Shift Uniqueness Test

003247616-06, P = 81.171074 Days, E = 125.640809 Days

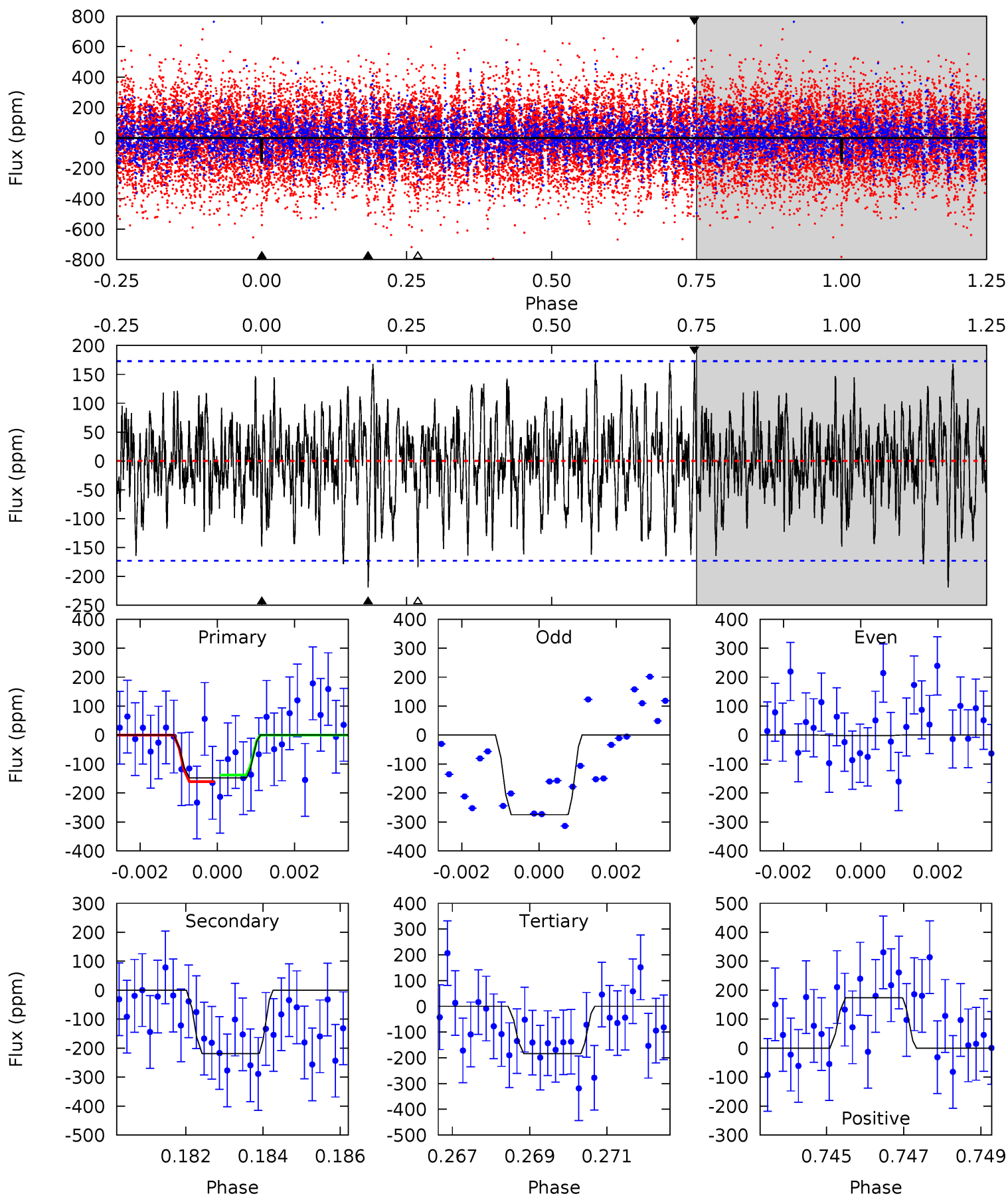
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.87	5.53	4.91	6.44	5.30	3.04	1.63	3.96	2.43	0.62	-0.91	0.97	0.89	0.42	1.19



# Alt Model-Shift Uniqueness Test

003247616-06, P = 81.171933 Days, E = 125.630324 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.57	6.76	5.68	5.37	5.33	3.10	1.79	-1.11	-0.80	1.08	1.39	4.22	2.92	0.44	0.36





### Stellar Parameters For KIC 003247616

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6915^{+187}_{-229}$	$3.665^{+0.315}_{-0.074}$	$-0.220^{+0.300}_{-0.250}$	$3.127^{+0.390}_{-1.091}$	$1.651^{+0.208}_{-0.312}$	$0.076^{+0.155}_{-0.018}$
	+3%/-3%	+9%/-2%	+136%/-114%	+12%/-35%	+13%/-19%	+204%/-24%
Source	PHO1	FLK73	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 003247616-06 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-125 \pm 23$	$4.57^{+2.52}_{-2.04}$	$1115^{+71}_{-88}$	$6021^{+2329}_{-1019}$	$617^{+1377}_{-363}$
Alt.	$-219 \pm 32$	$3.82^{+2.26}_{-2.10}$	$1116^{+67}_{-98}$	$7829^{+5804}_{-1787}$	$1596^{+5888}_{-995}$

$T_{\text{max}}$  = Theoretical Maximum Planetary Temperature  
 $T_{\text{obs}}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )  
 $A_{\text{obs}}$  = Observed Albedo (Assuming  $T=0$ )

If a secondary eclipse is present, the system is likely an EB if  $T_{\text{obs}} \gg T_{\text{max}}$  AND  $A_{\text{obs}} \gg 1.0$

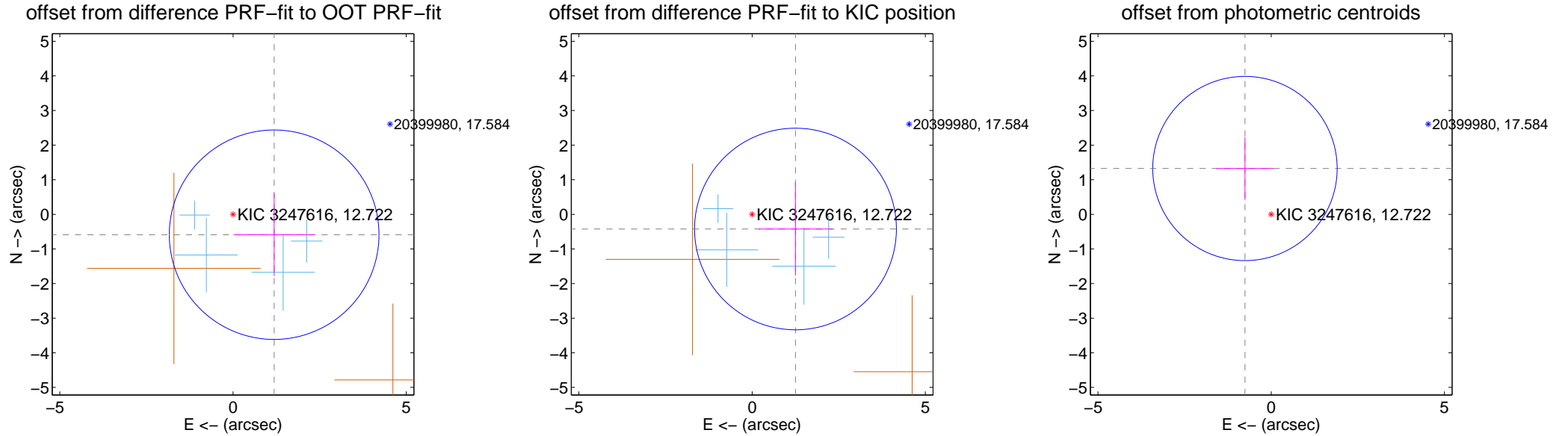
## DV Centroid Data

Supplemental centroid analysis for 003247616-06. Kepler magnitude: 12.72. Transit SNR 7.34

There are 4 quarters with good PRF difference image offsets

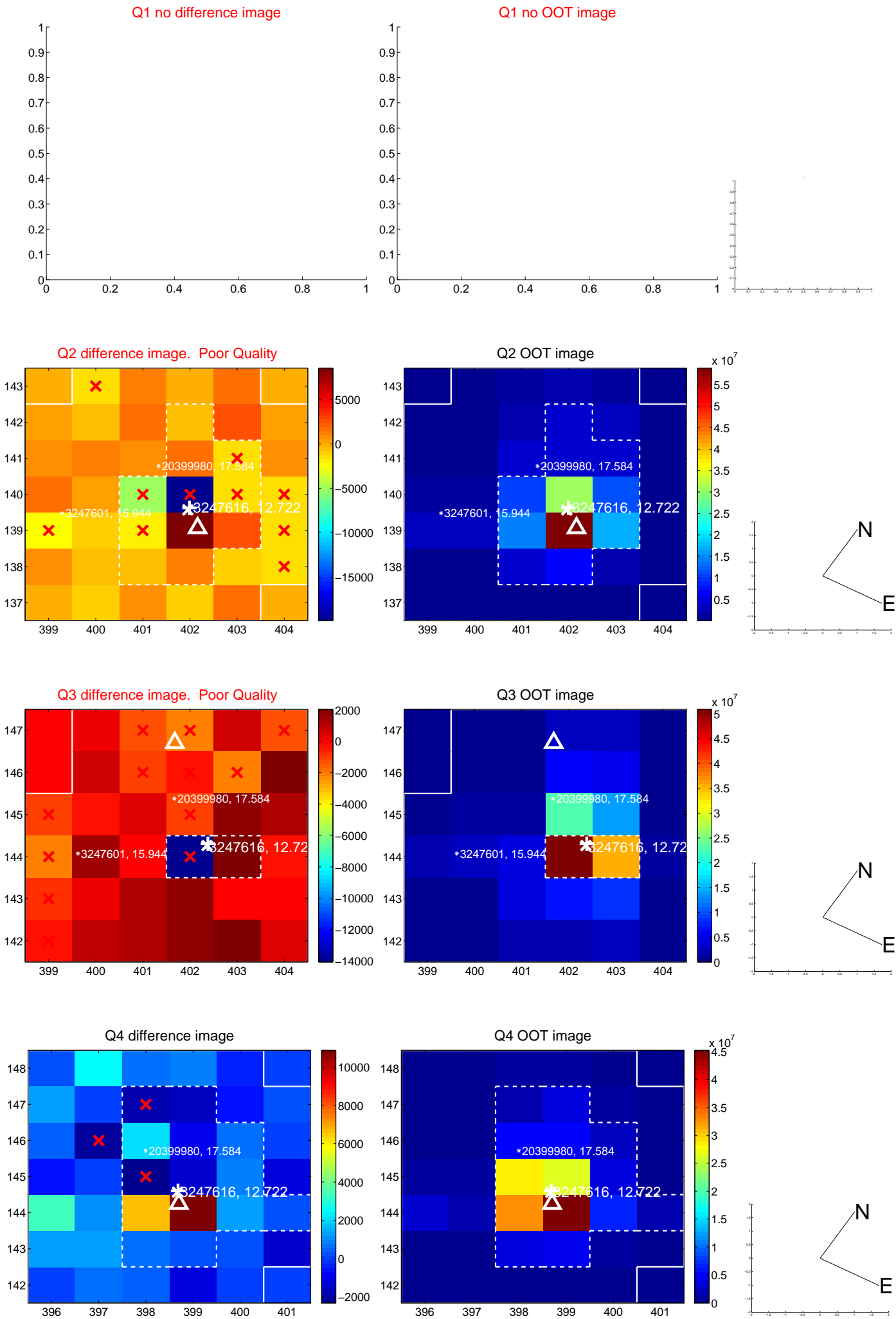
The direct PRF centroid is offset from the target star catalog position by about 0.18 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.325 \pm 1.008$	1.31	$-1.187 \pm 1.177$	$-0.588 \pm 1.190$
PRF-fit source offset from KIC position	$1.321 \pm 0.971$	1.36	$-1.251 \pm 1.072$	$-0.424 \pm 1.344$
photometric centroid source offset	$1.53 \pm 0.89$	1.72	$0.76 \pm 0.83$	$1.32 \pm 0.91$

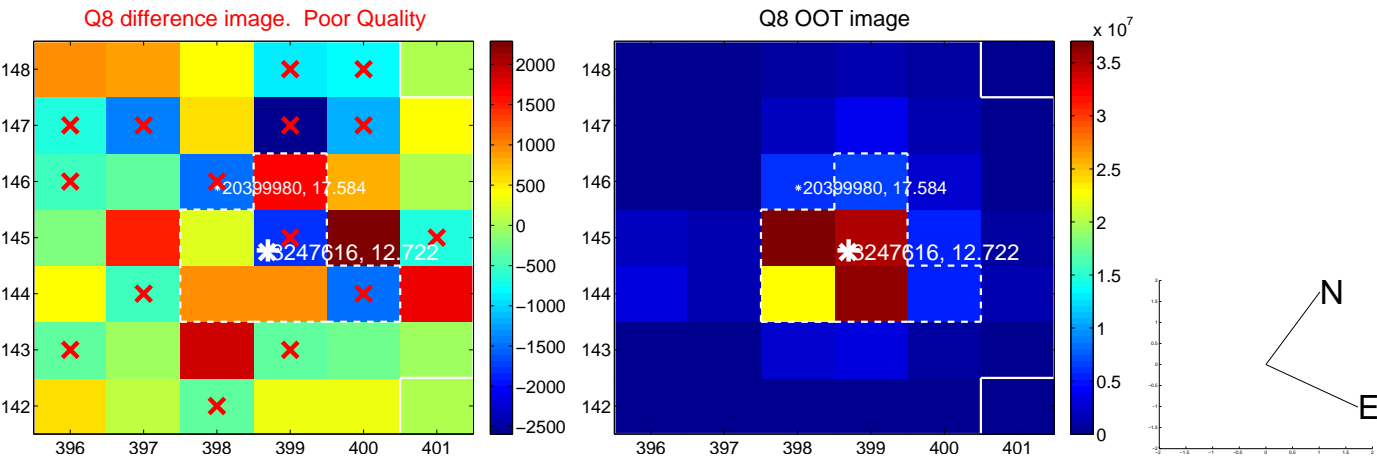
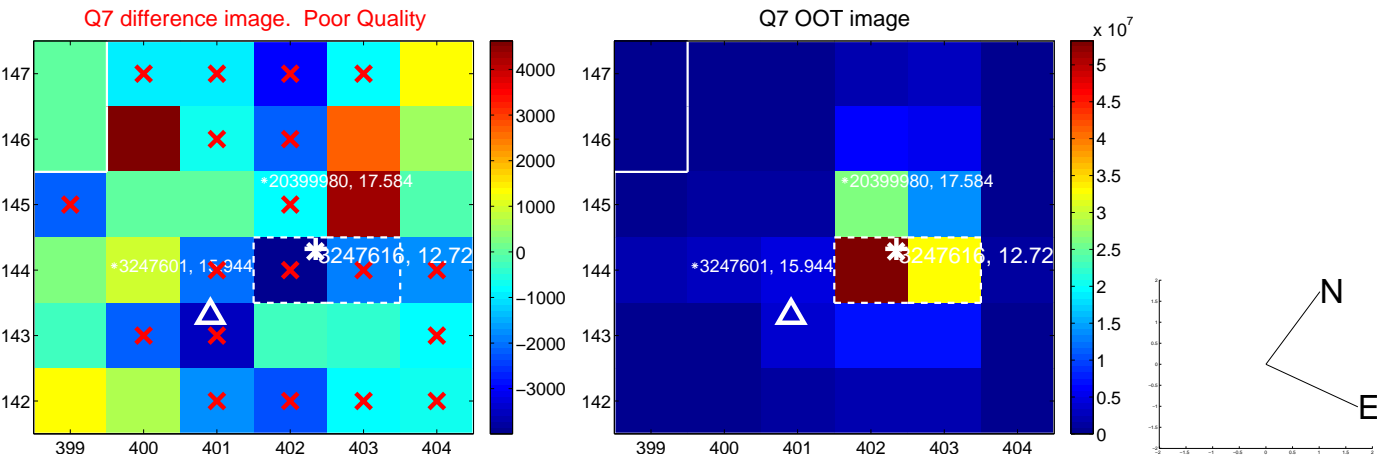
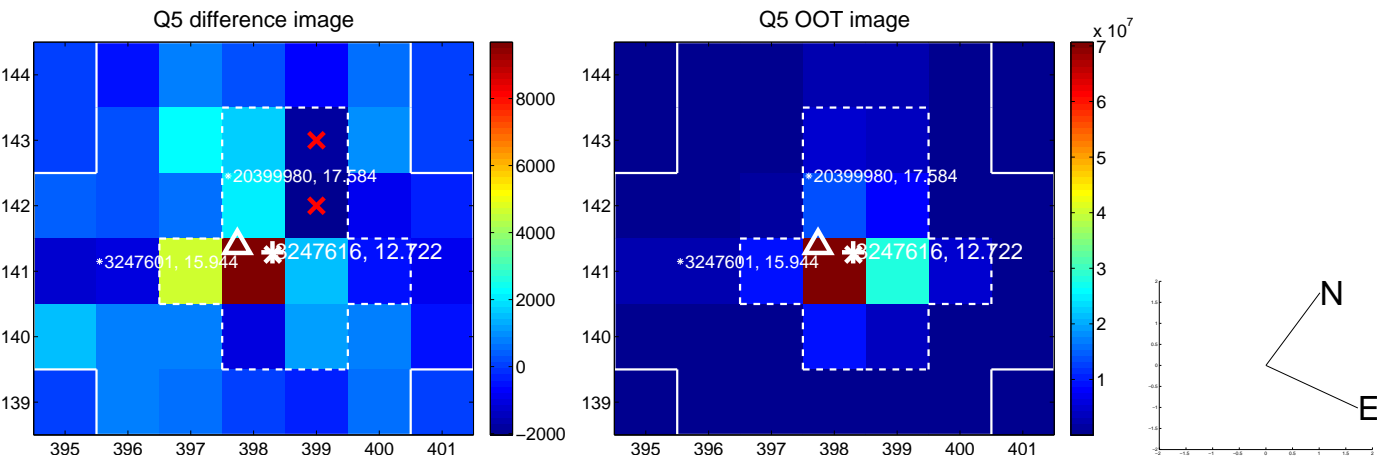


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

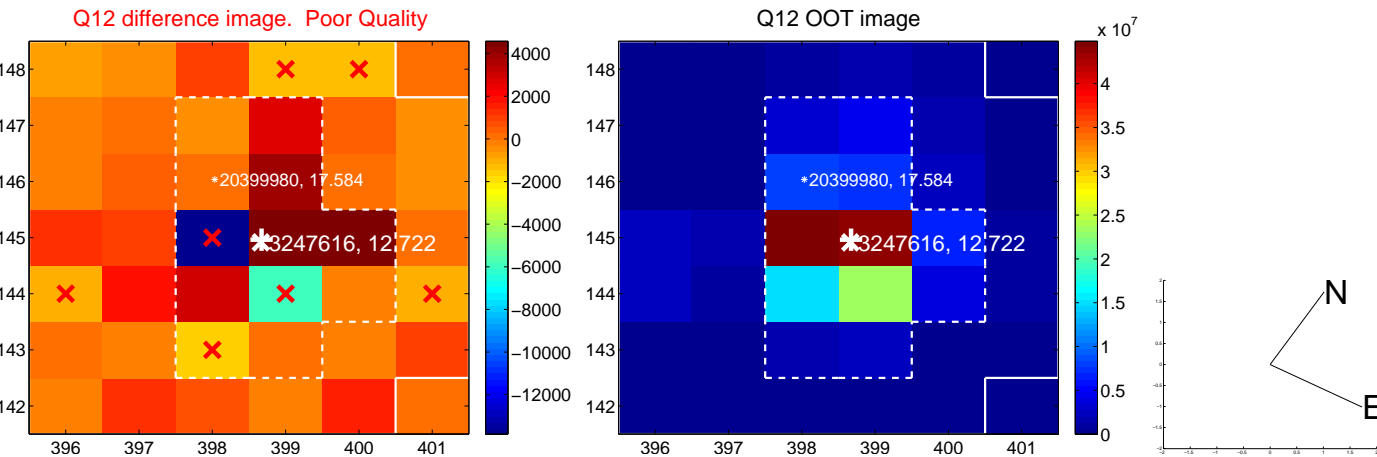
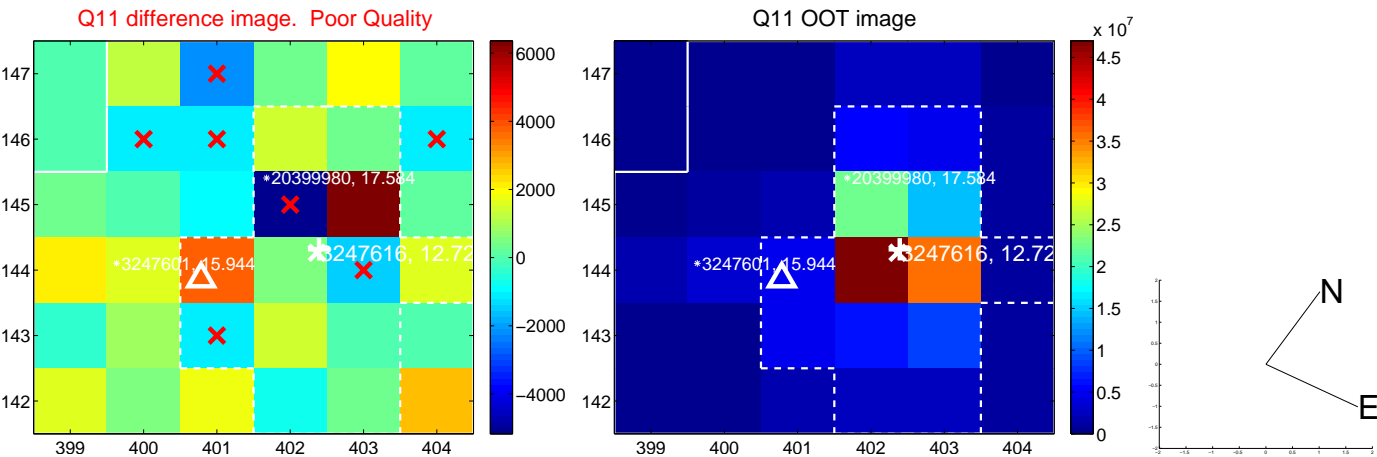
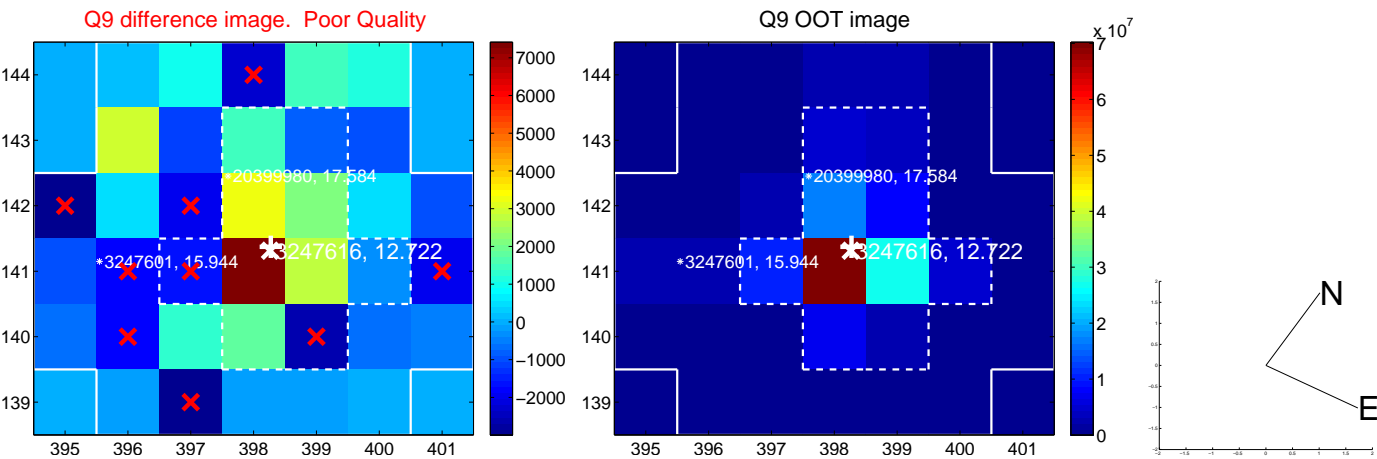
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



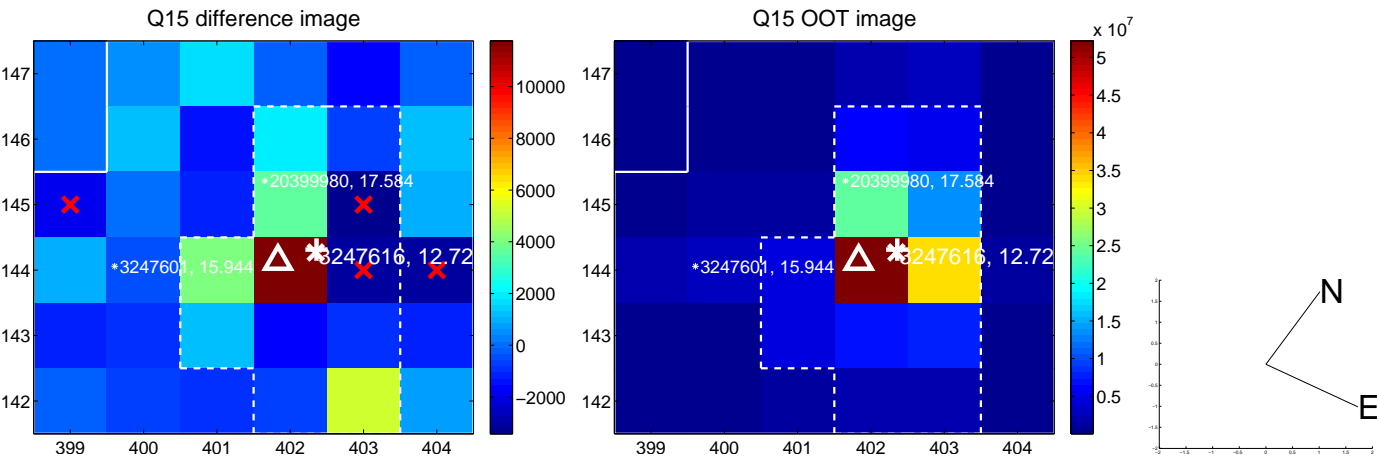
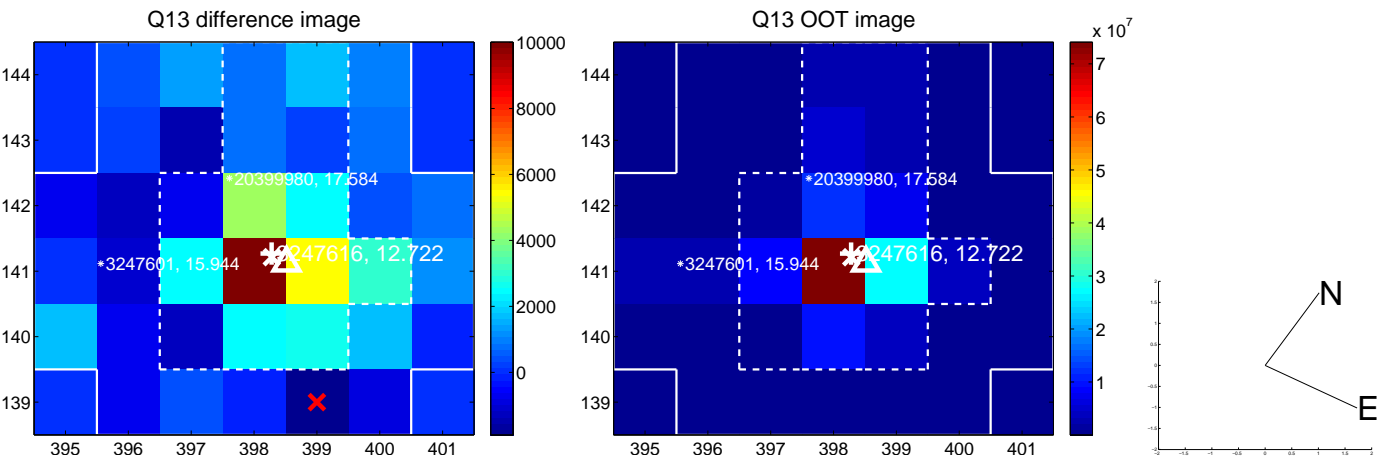
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



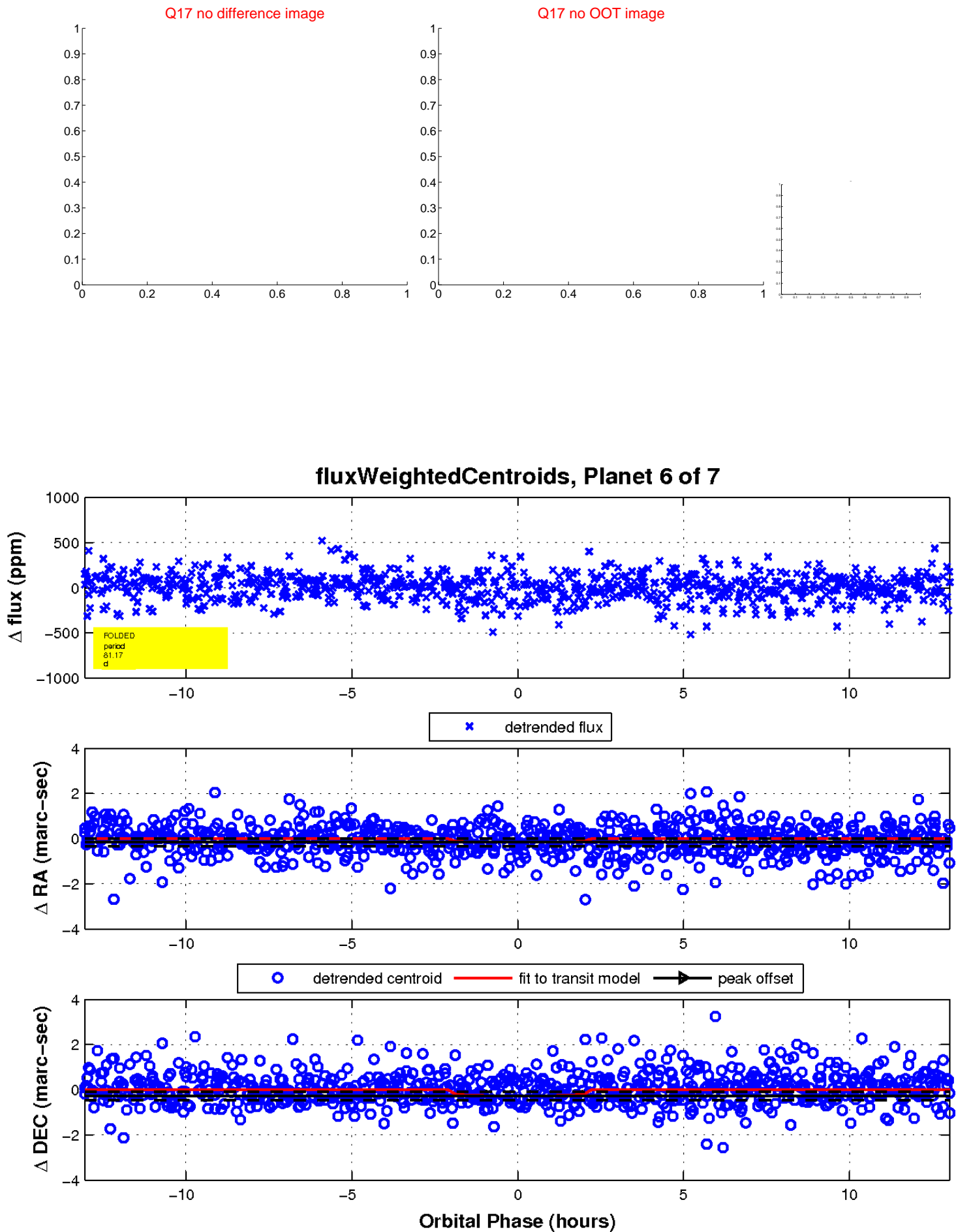
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



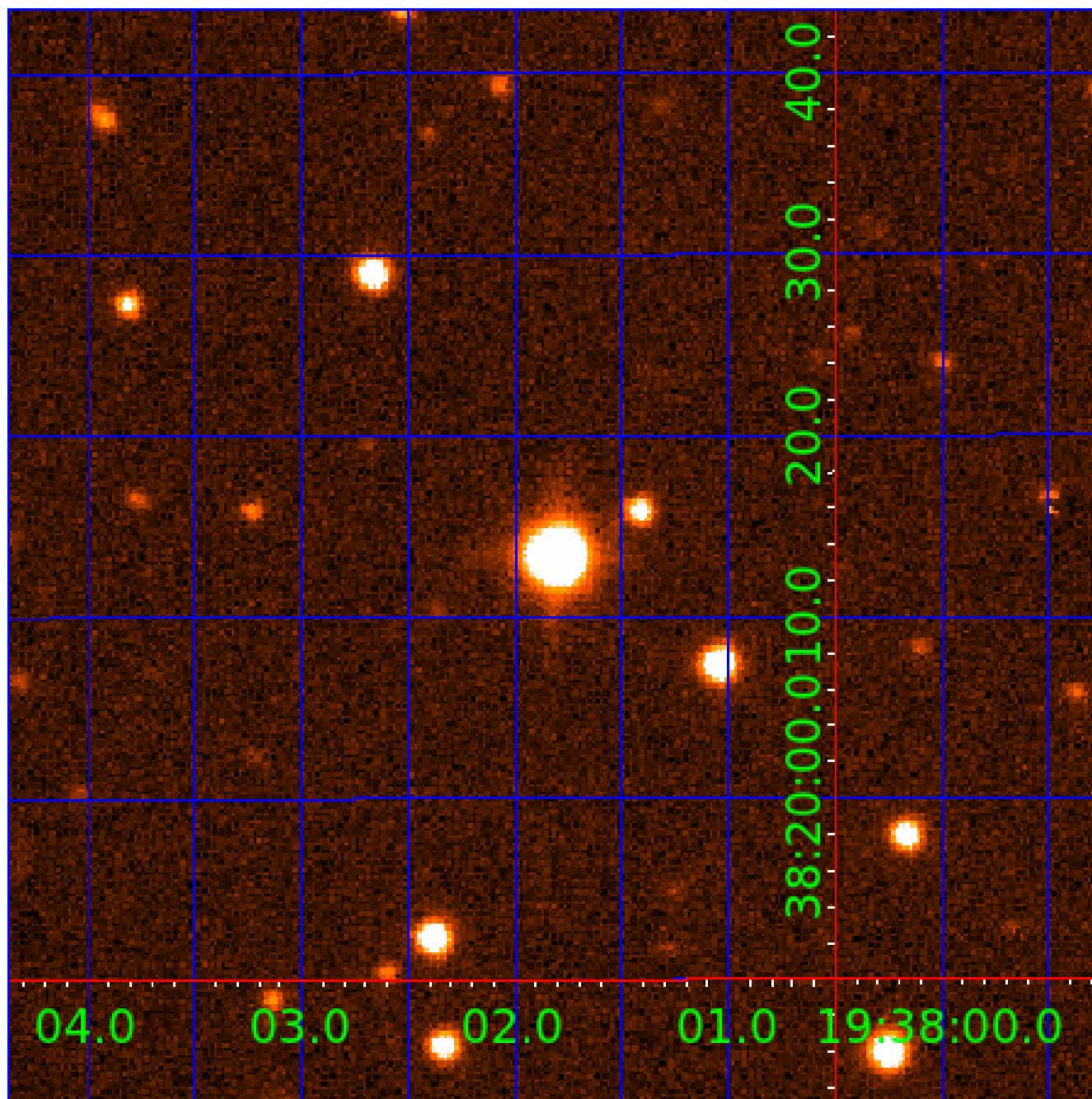
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





UKIRT Image

Declination



# KIC 003247616

## Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	$R_{\star}$ ( $R_{\odot}$ )	$T_{\star}$ (K)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003247616-01	OBS	No	3.471928	132.100191	70.7	9.800	12.2	14.5	3.13	6915	4.99	7123.95
003247616-02	OBS	No	3.472358	134.876085	0.0	6.691	10.0	0.0	3.13	6915	0.01	7122.77
003247616-03	OBS	No	3.471931	134.373317	32.8	8.764	8.9	9.3	3.13	6915	2.22	7123.94
003247616-04	OBS	No	289.107157	379.348536	246.4	21.063	11.6	7.5	3.13	6915	5.82	19.59
003247616-05	OBS	No	126.523774	180.521913	349.7	3.437	8.5	9.1	3.13	6915	6.71	58.96
003247616-06	OBS	No	81.171074	206.811883	195.3	4.351	7.5	7.3	3.13	6915	4.94	106.56
003247616-07	OBS	No	148.796891	198.768348	291.8	4.044	7.3	7.9	3.13	6915	7.04	47.50

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003247616-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV
003247616-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—SWEET_NTL—LPP_DV—SAME_NTL_PERIOD—CENT_FEW_DIFFS
003247616-03	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—SAME_NTL_PERIOD
003247616-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
003247616-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT
003247616-06	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
003247616-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

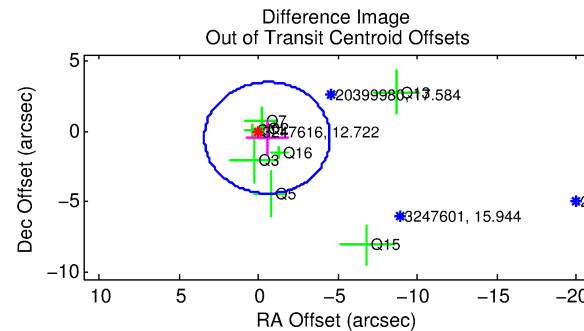
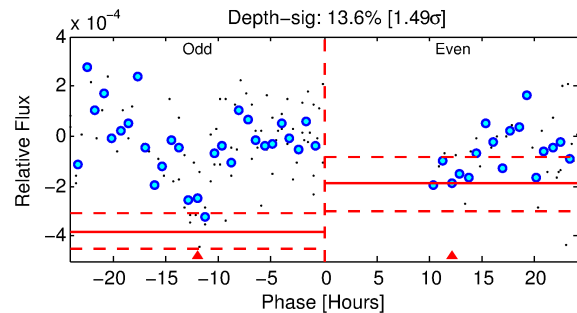
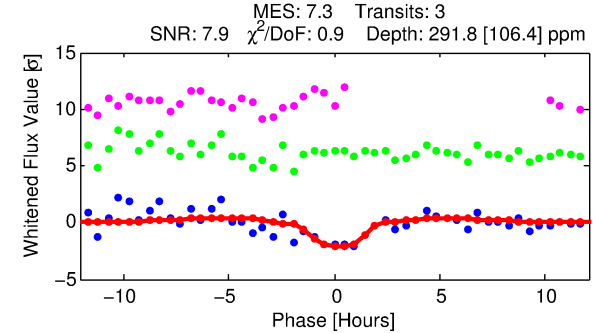
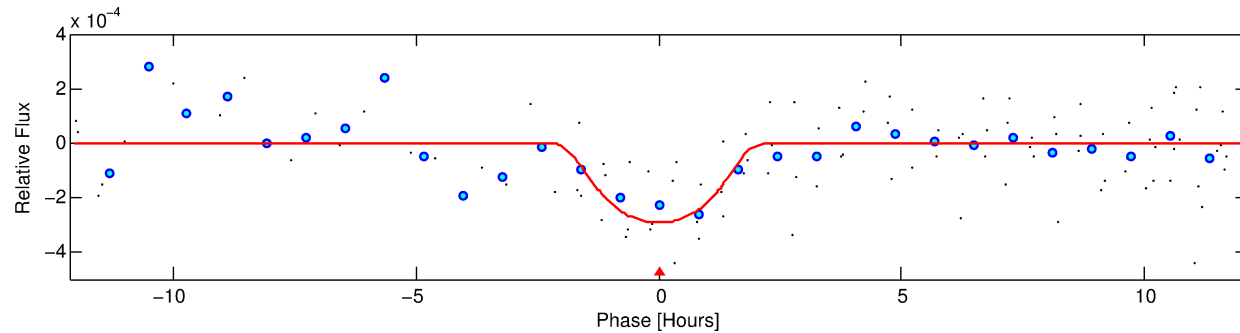
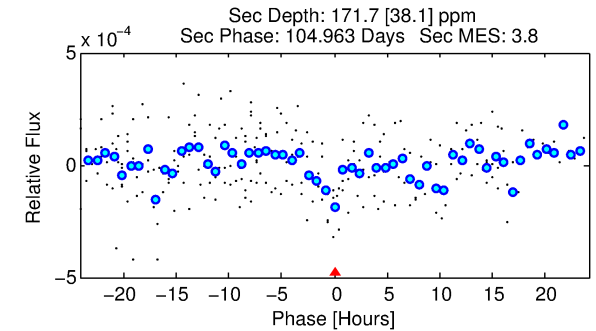
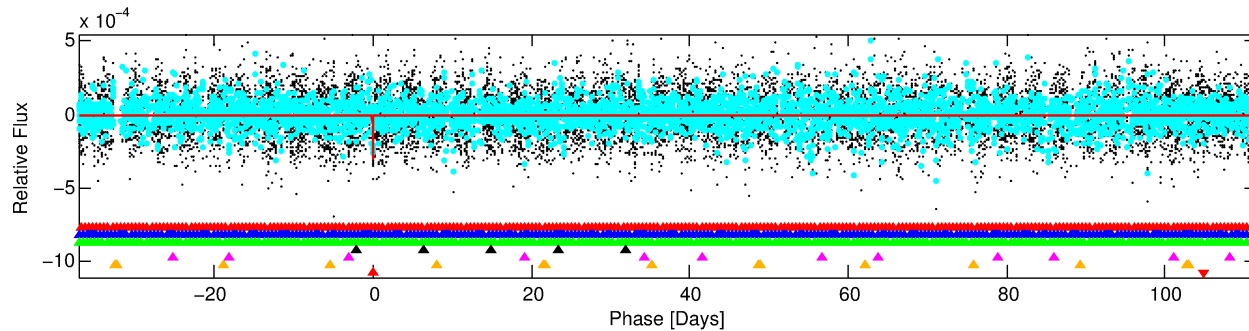
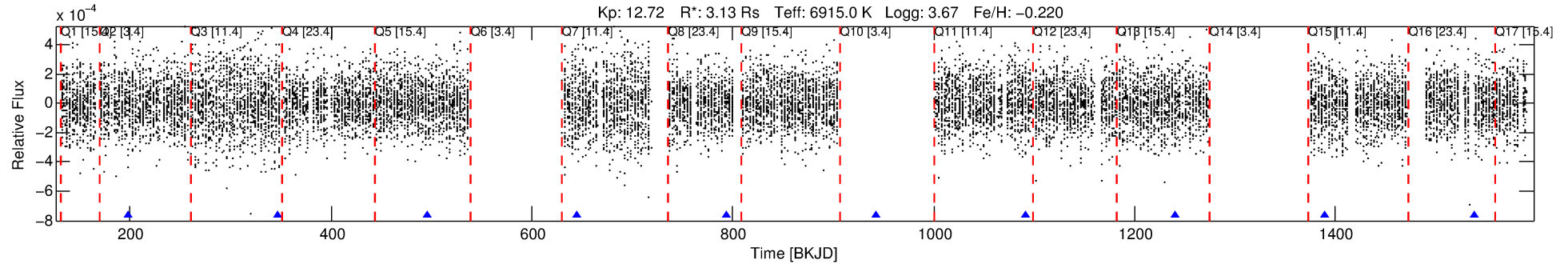
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 003247616-07

No Significant Match Found

# DV One-Page Summary

KIC: 3247616 Candidate: 7 of 7 Period: 148.797 d



## DV Fit Results:

Period = 148.79689 [0.00223] d  
Epoch = 198.7683 [0.0116] BKJD  
Rp/R\* = 0.0206 [0.0057]  
a/R\* = 80.67 [31.09]  
b = 0.98 [0.02]  
Seff = 47.50 [26.25]  
Teff = 669 [92] K  
Rp = 7.04 [3.14] Re  
a = 0.6494 [0.2179] AU  
Ag = 803.30 [644.27] [1.25σ]  
Teffp = 5510 [841] K [5.72σ]

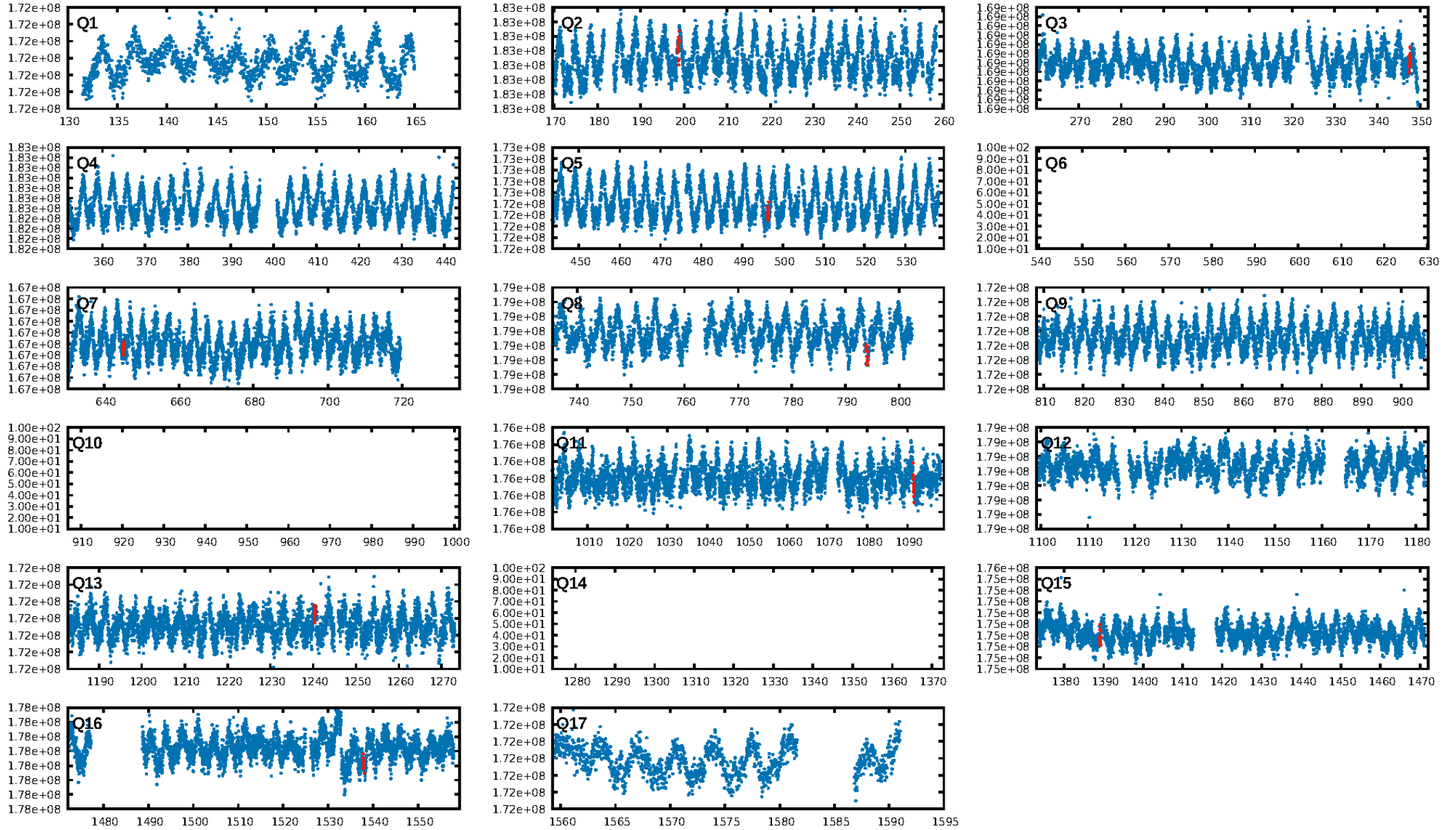
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [100.72σ]  
LongPeriod-sig: 100.0% [157.01σ]  
ModelChiSquare2-sig: 8.8%  
ModelChiSquareGof-sig: 88.9%  
**Bootstrap-pfa: 1.71e-09**  
RollingBand-fgt: 1.00 [3/3]  
**GhostDiagnostic-chr: -2.285**  
Centroid-sig: 71.3%  
Centroid-so: 0.460 arcsec [0.53σ]  
OotOffset-rm: 0.723 arcsec [0.55σ]  
OotOffset-st: 1/4/1/2 [8]  
KicOffset-rm: 0.638 arcsec [0.60σ]  
KicOffset-st: 1/4/1/2 [8]  
DiffImageQuality-fgm: 0.25 [2/8]  
DiffImageOverlap-fno: 0.33 [3/9]

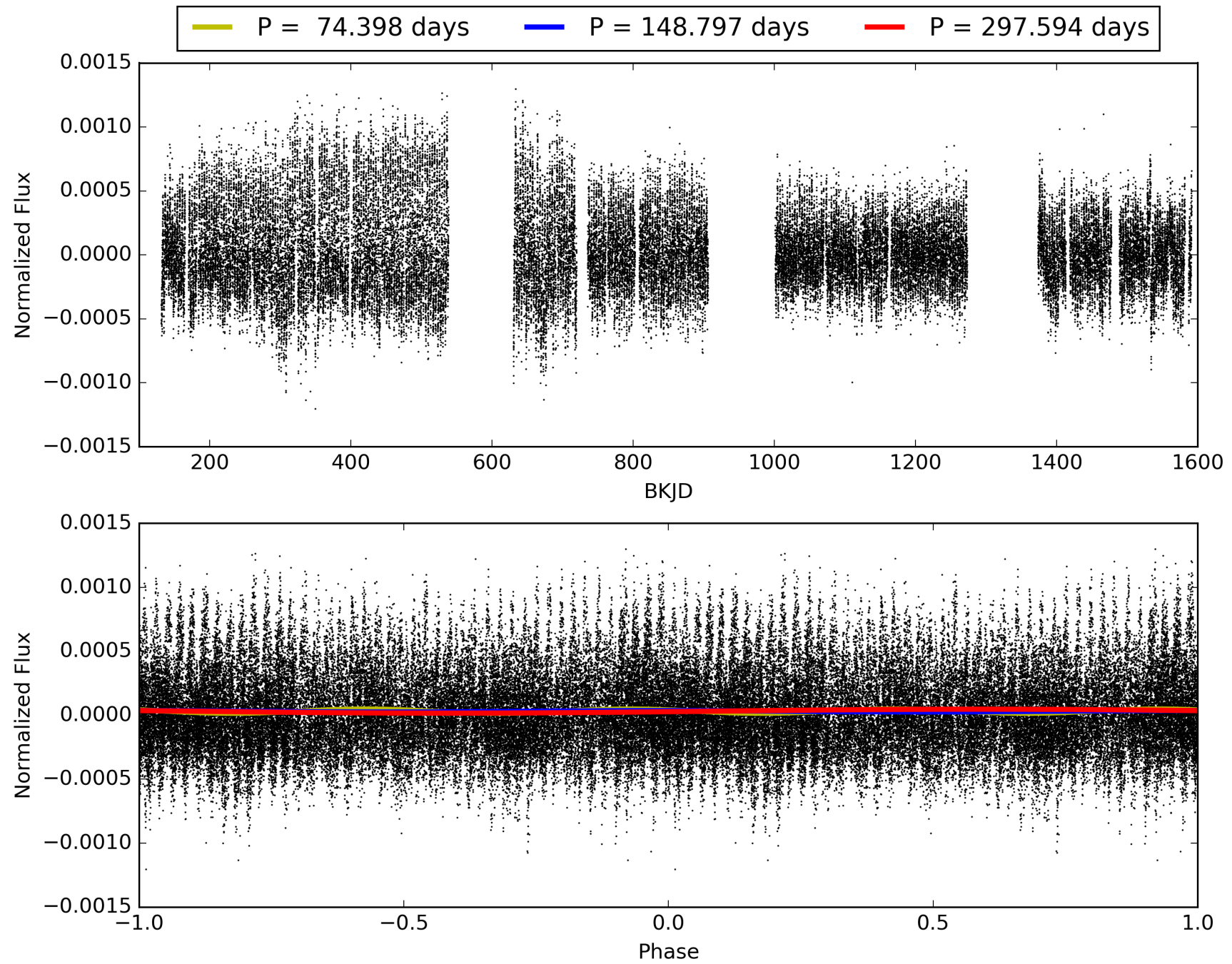
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 13:10:30 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 003247616-07, PDC Light Curves

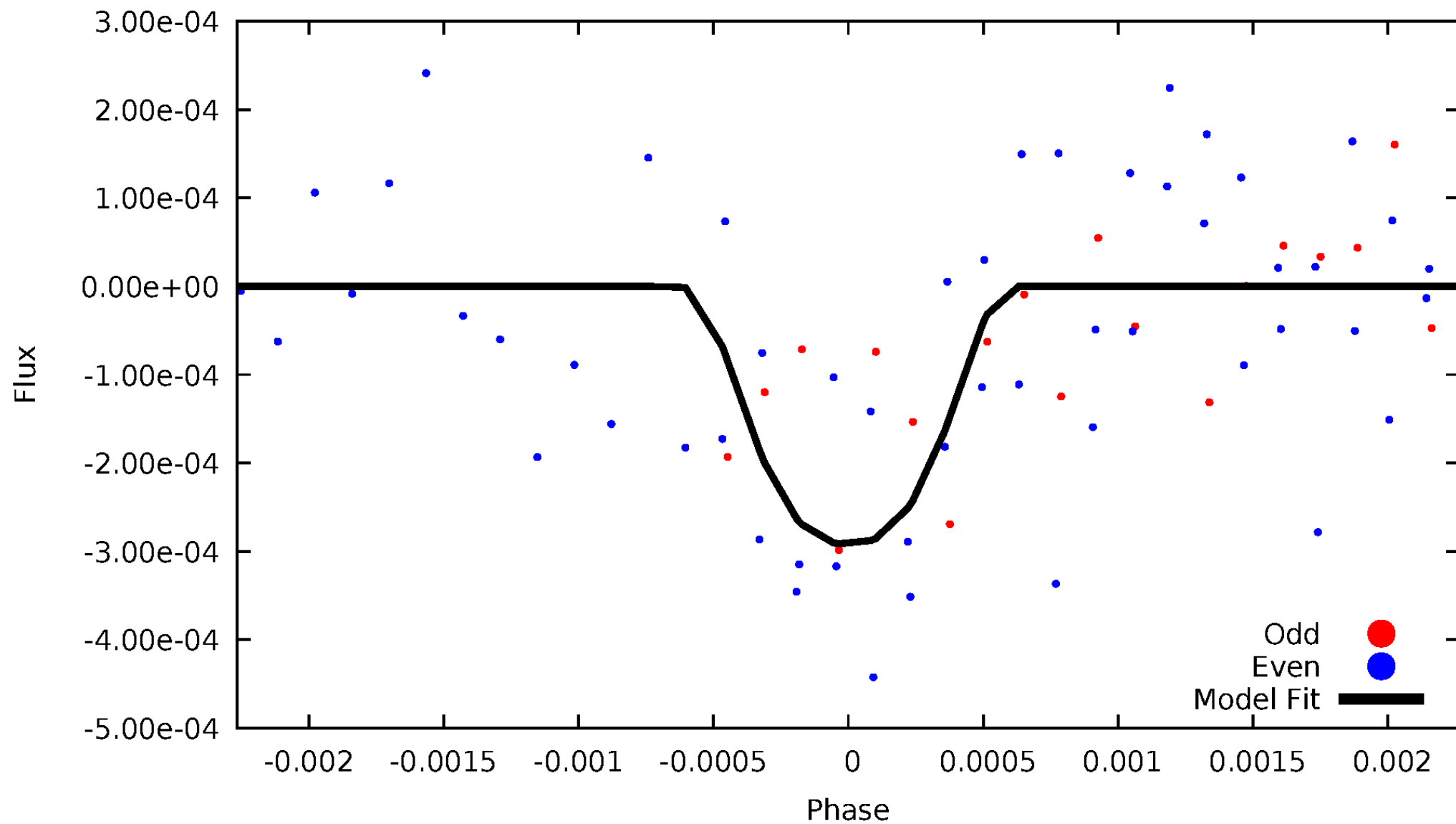


TCE 003247616-07



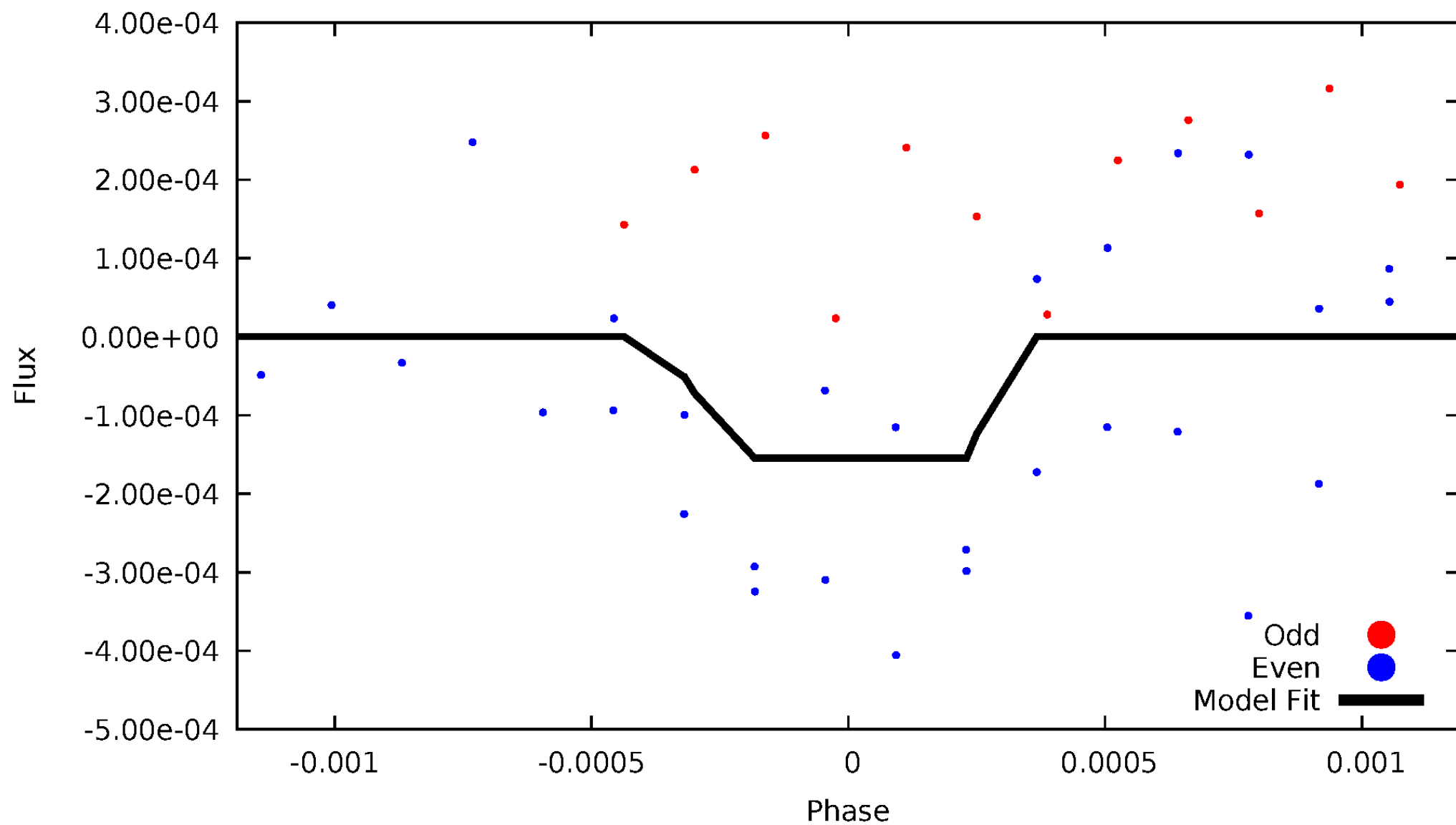
# DV Odd/Even

TCE 003247616-07



# ALT Odd/Even

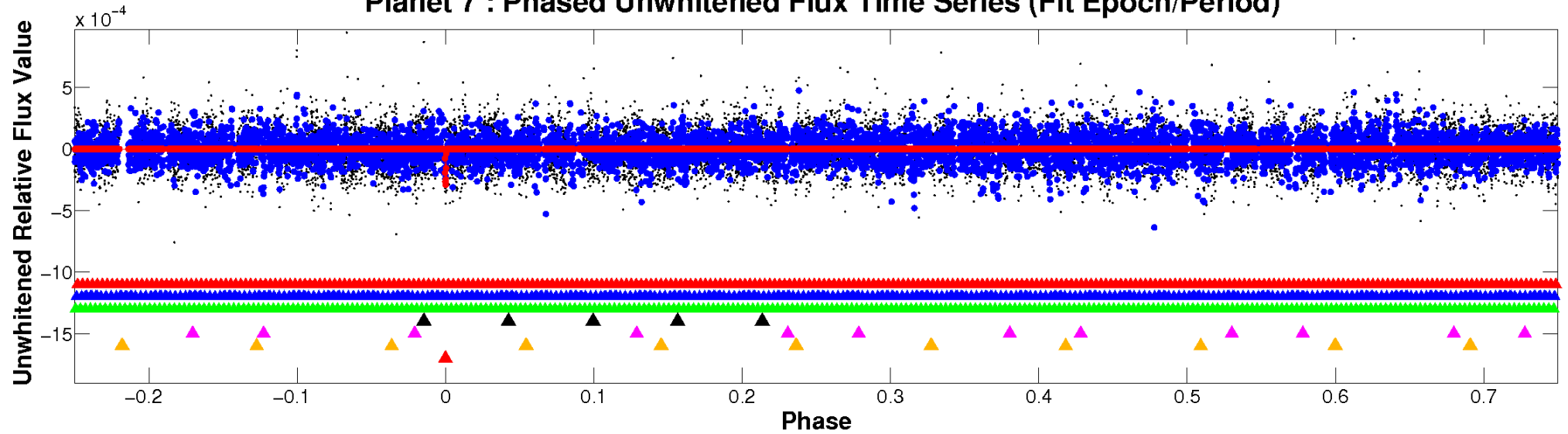
TCE 003247616-07



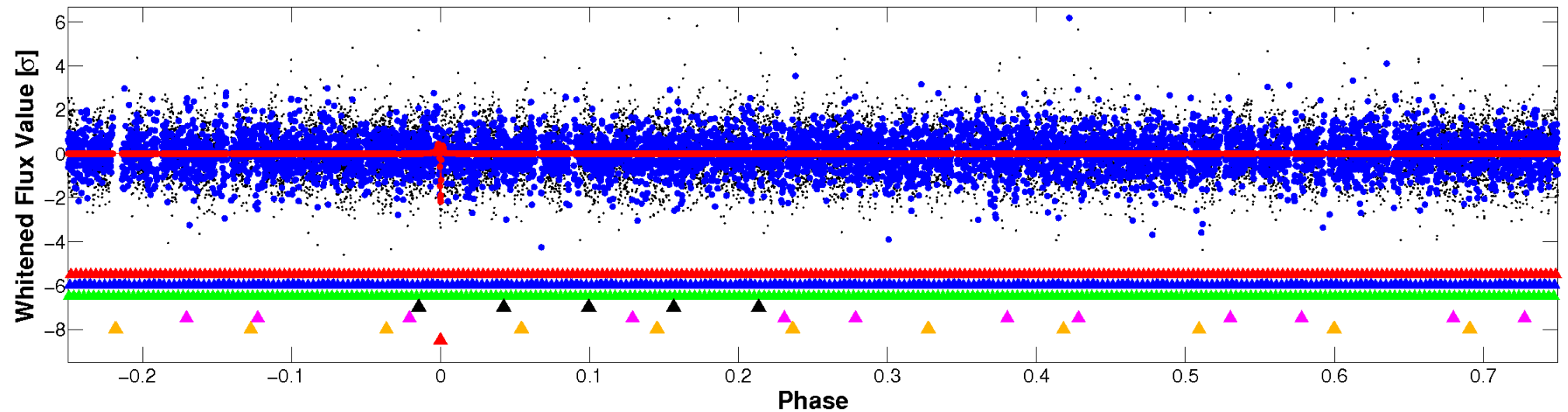


# Non-Whitened Vs. Whitened Light Curve

Planet 7 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

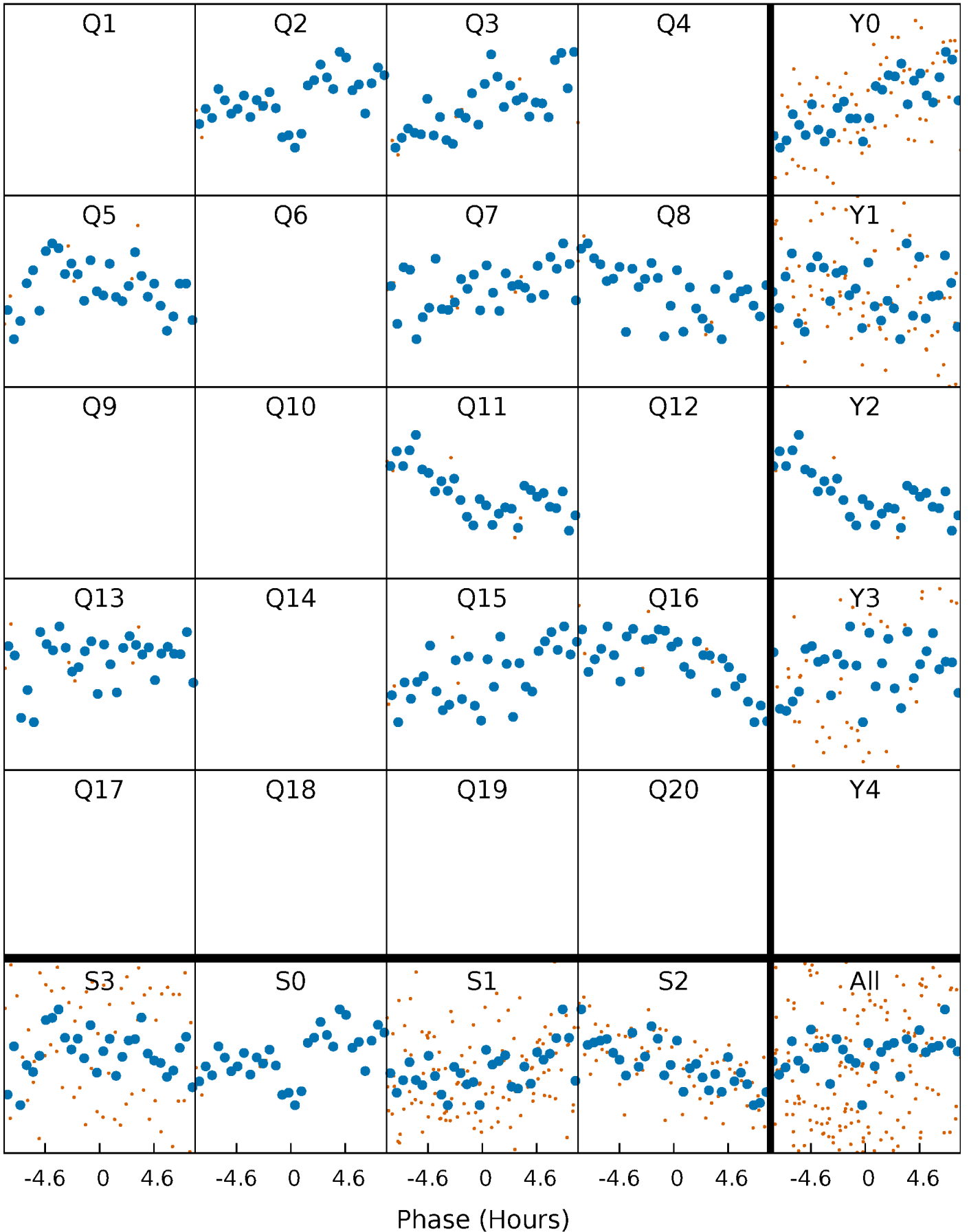


Planet 7 : Phased Whitened Flux Time Series (Fit Epoch/Period)



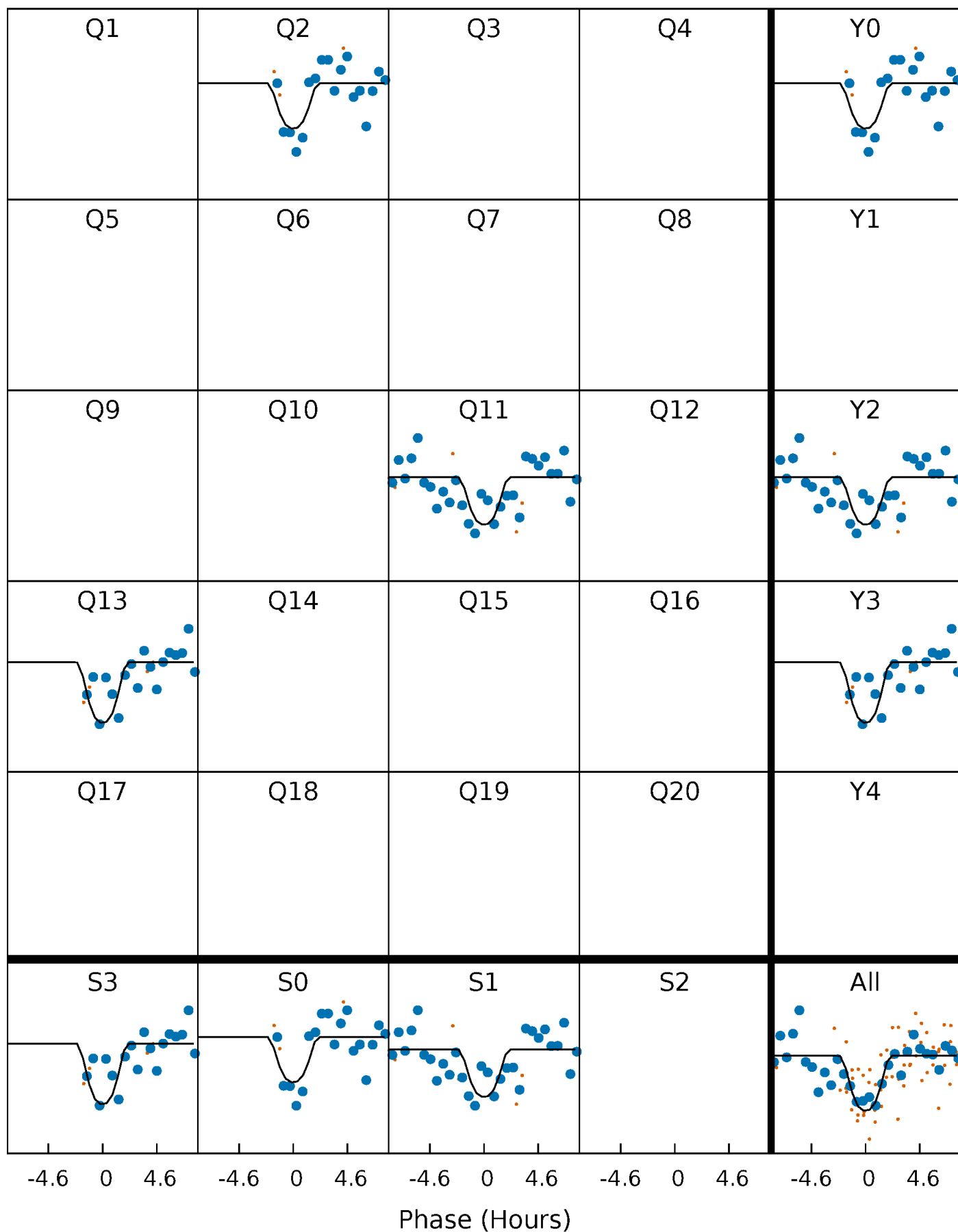
# PDC Quarter-Phased Transit Curves

TCE 003247616-07 P=148.796891 Days  $T_0=198.768349$  (BKJD)



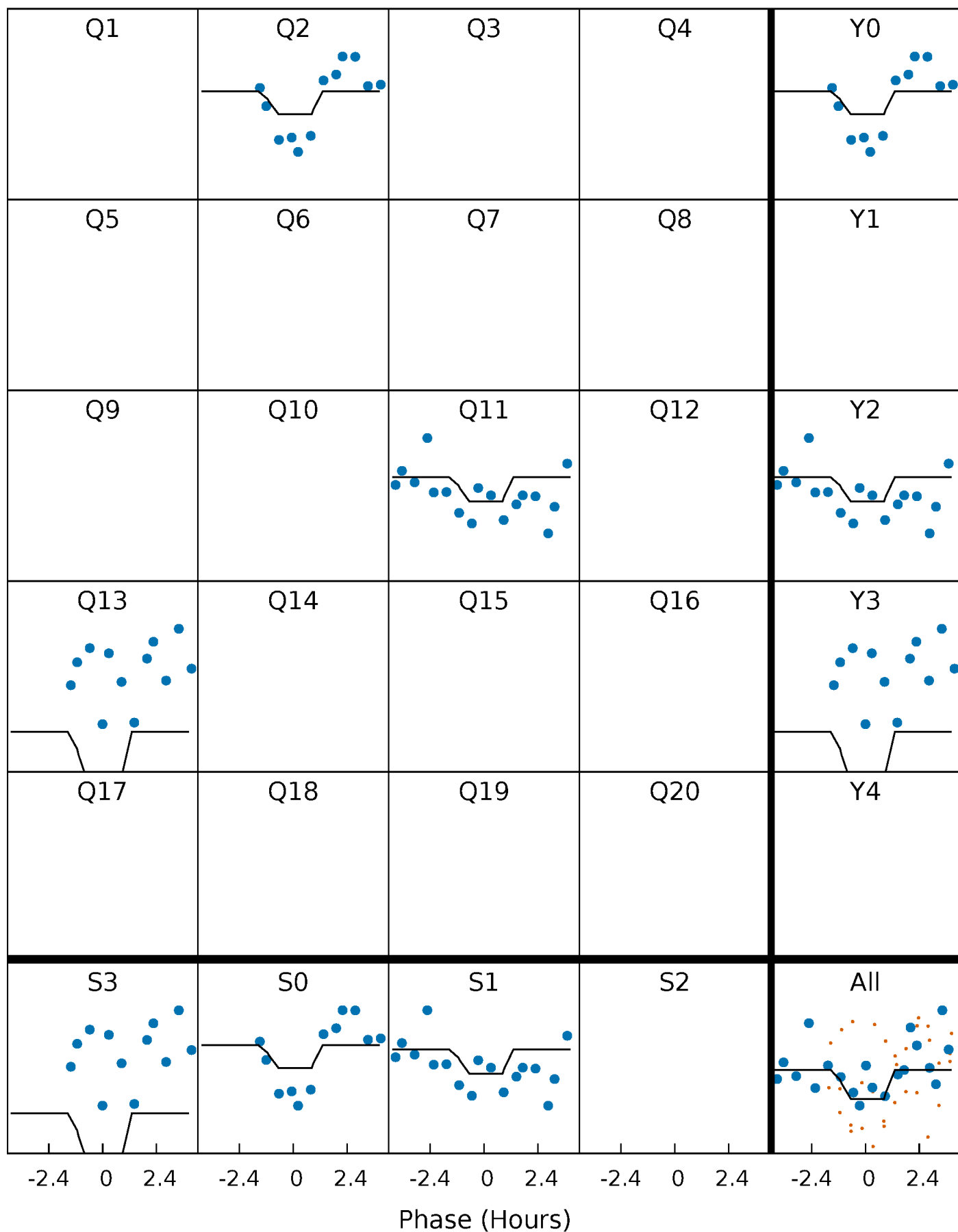
# DV Quarter-Phased Transit Curves

TCE 003247616-07 P=148.796891 Days  $T_0=198.768349$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

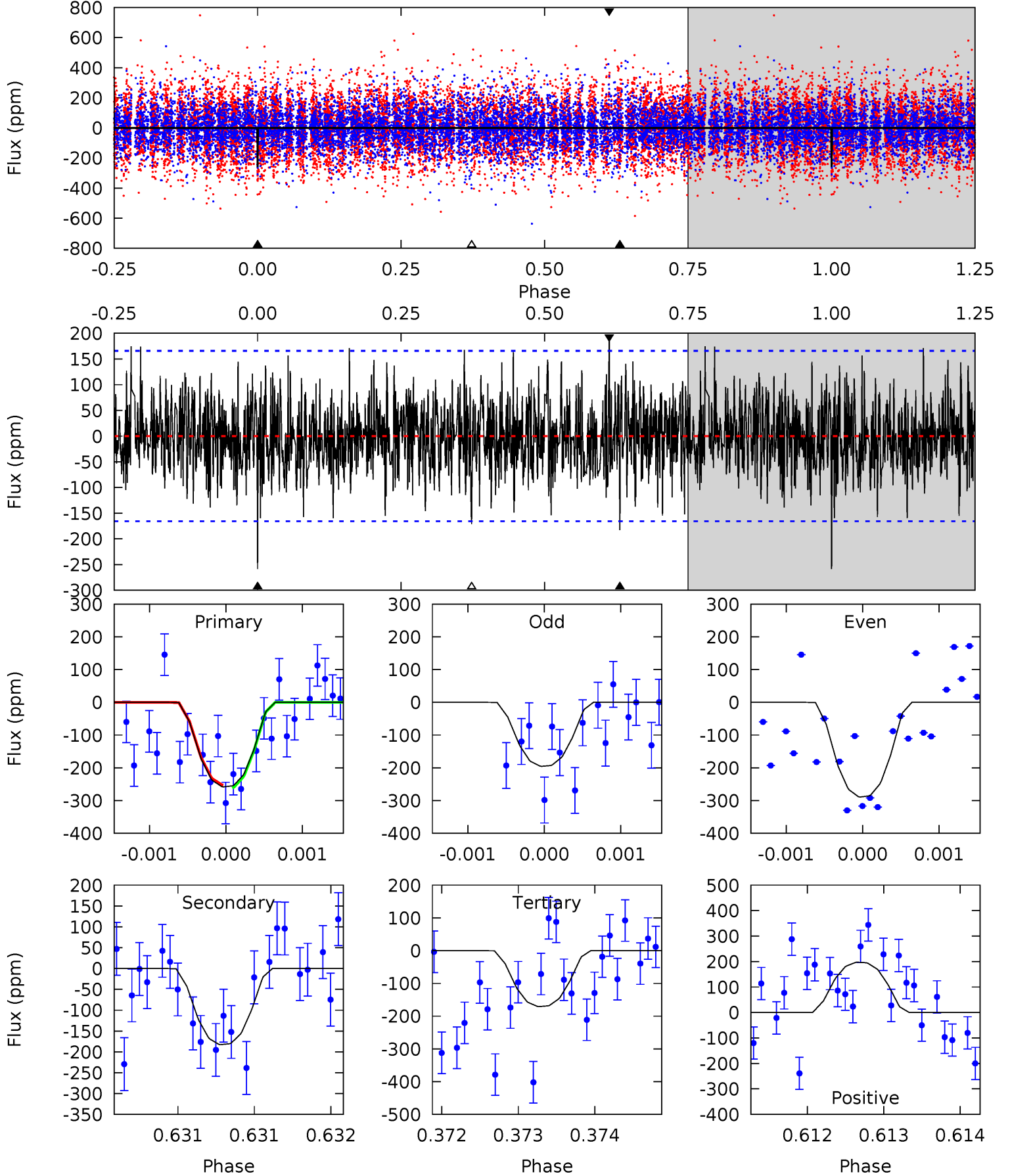
TCE 003247616-07 P=148.796667 Days  $T_0=198.768322$  (BKJD)



# DV Model-Shift Uniqueness Test

003247616-07, P = 148.796891 Days, E = 49.971458 Days

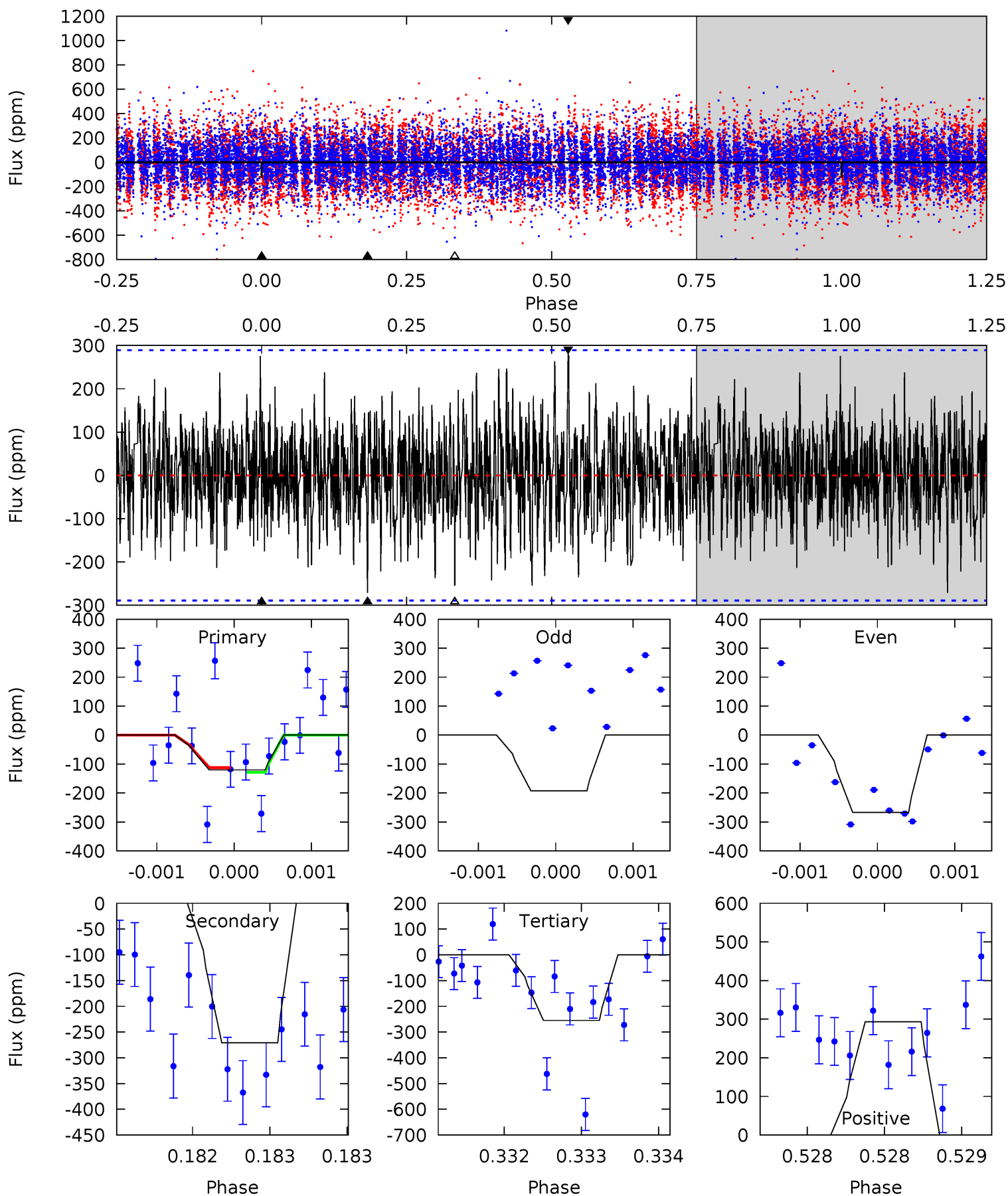
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.51	6.02	5.63	6.51	5.45	3.30	1.72	2.88	2.00	0.39	-0.49	1.40	0.97	0.43	0.14



# Alt Model-Shift Uniqueness Test

003247616-07, P = 148.796667 Days, E = 49.971655 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.31	5.20	4.90	5.63	5.55	3.45	1.45	-2.59	-3.32	0.31	-0.43	0.66	0.57	0.52	0.16



### Stellar Parameters For KIC 003247616

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6915^{+187}_{-229}$	$3.665^{+0.315}_{-0.074}$	$-0.220^{+0.300}_{-0.250}$	$3.127^{+0.390}_{-1.091}$	$1.651^{+0.208}_{-0.312}$	$0.076^{+0.155}_{-0.018}$
	+3%/-3%	+9%/-2%	+136%/-114%	+12%/-35%	+13%/-19%	+204%/-24%
Source	PHO1	FLK73	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 003247616-07 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-183 \pm 30$	$6.52^{+2.10}_{-2.05}$	$914^{+50}_{-74}$	$5624^{+998}_{-632}$	$1036^{+1093}_{-465}$
Alt.	$-271 \pm 52$	$4.04^{+2.08}_{-1.84}$	$915^{+48}_{-81}$	$8090^{+4195}_{-1670}$	$3917^{+9414}_{-2234}$

$T_{\text{max}}$  = Theoretical Maximum Planetary Temperature  
 $T_{\text{obs}}$  = Observed Planetary Temperature (Assuming A=0.3)  
 $A_{\text{obs}}$  = Observed Albedo (Assuming T=0)

If a secondary eclipse is present, the system is likely an EB if  $T_{\text{obs}} \gg T_{\text{max}}$  AND  $A_{\text{obs}} \gg 1.0$



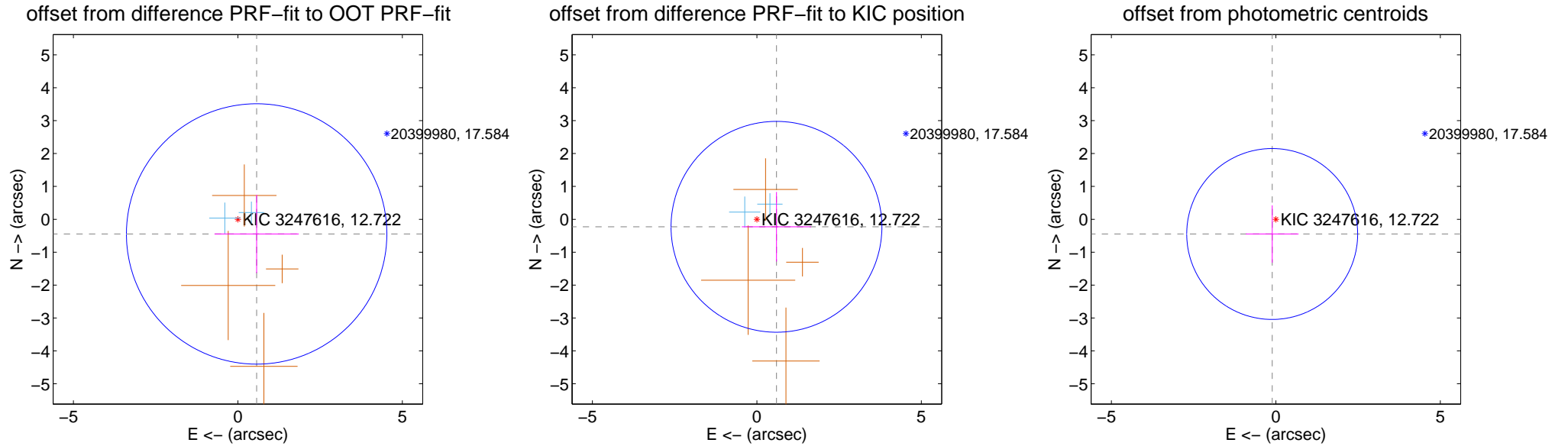
## DV Centroid Data

Supplemental centroid analysis for 003247616-07. Kepler magnitude: 12.72. Transit SNR 7.88

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.21 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.723 \pm 1.319$	0.55	$-0.570 \pm 1.283$	$-0.445 \pm 1.190$
PRF-fit source offset from KIC position	$0.638 \pm 1.068$	0.60	$-0.596 \pm 1.053$	$-0.228 \pm 1.058$
photometric centroid source offset	$0.46 \pm 0.87$	0.53	$0.11 \pm 0.80$	$-0.45 \pm 0.87$



Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

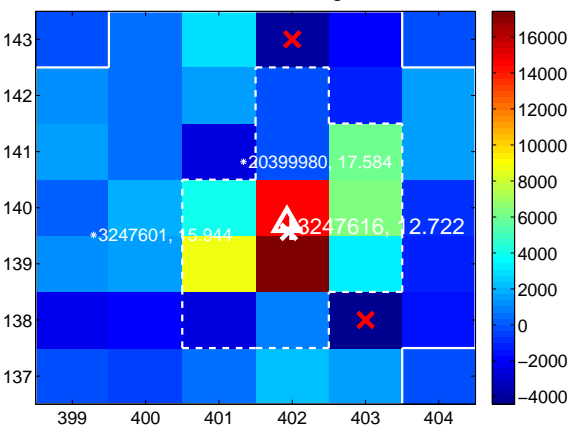
Q1 no difference image



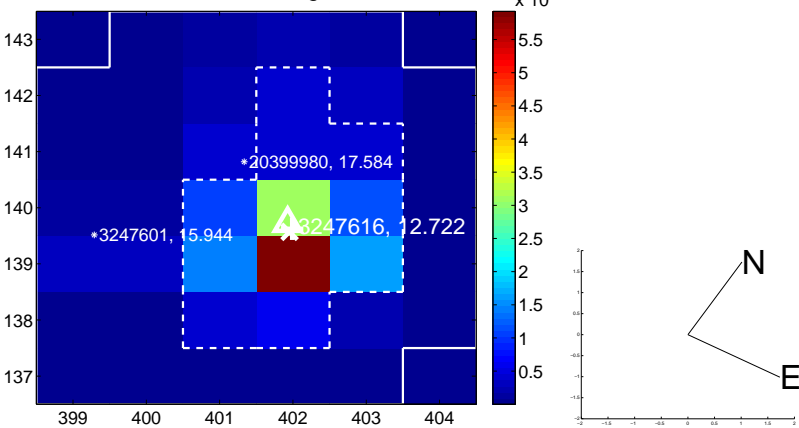
Q1 no OOT image



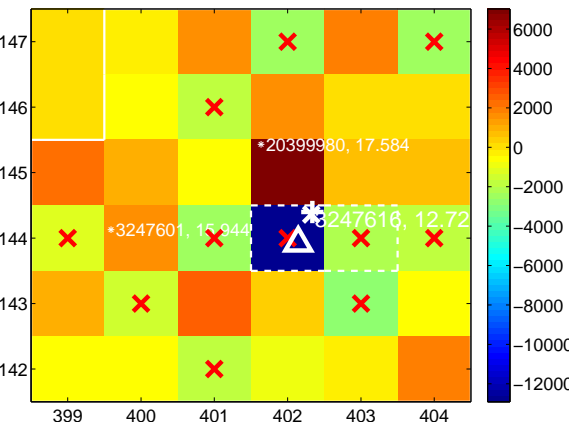
Q2 difference image



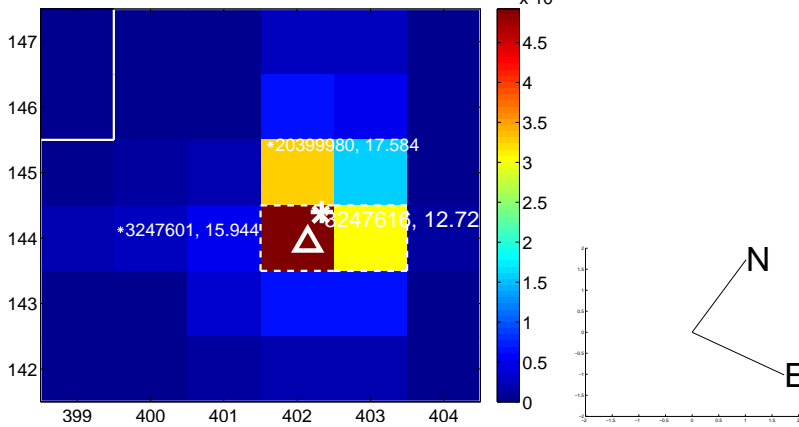
Q2 OOT image



Q3 difference image. Poor Quality



Q3 OOT image



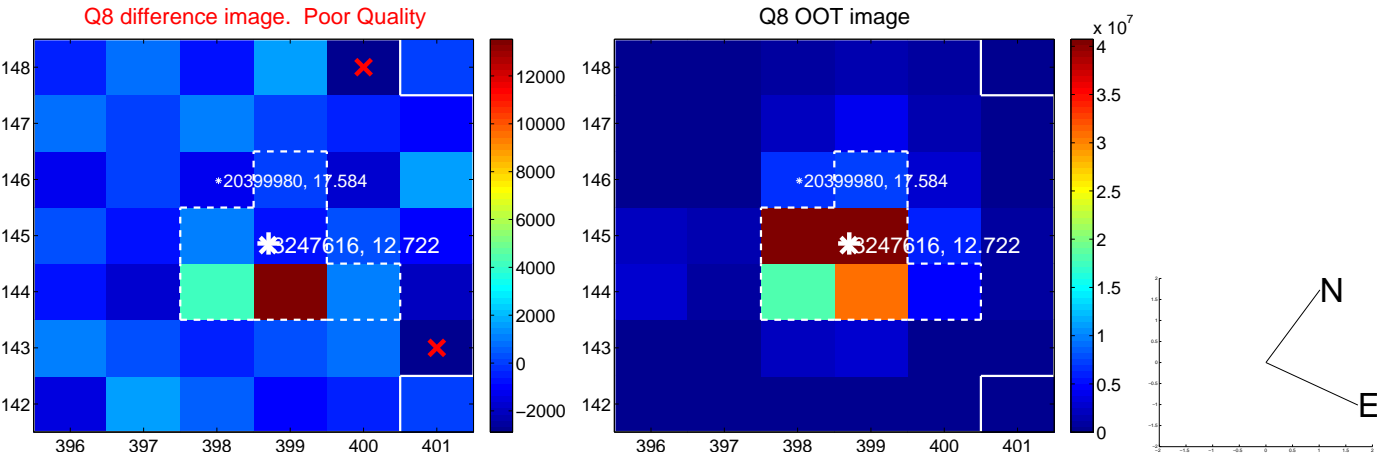
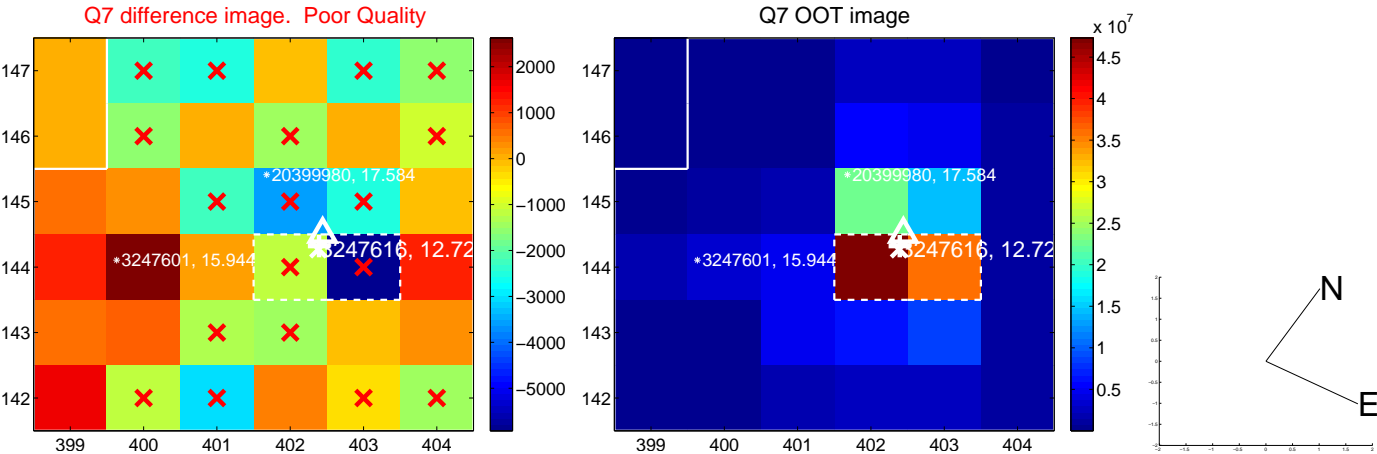
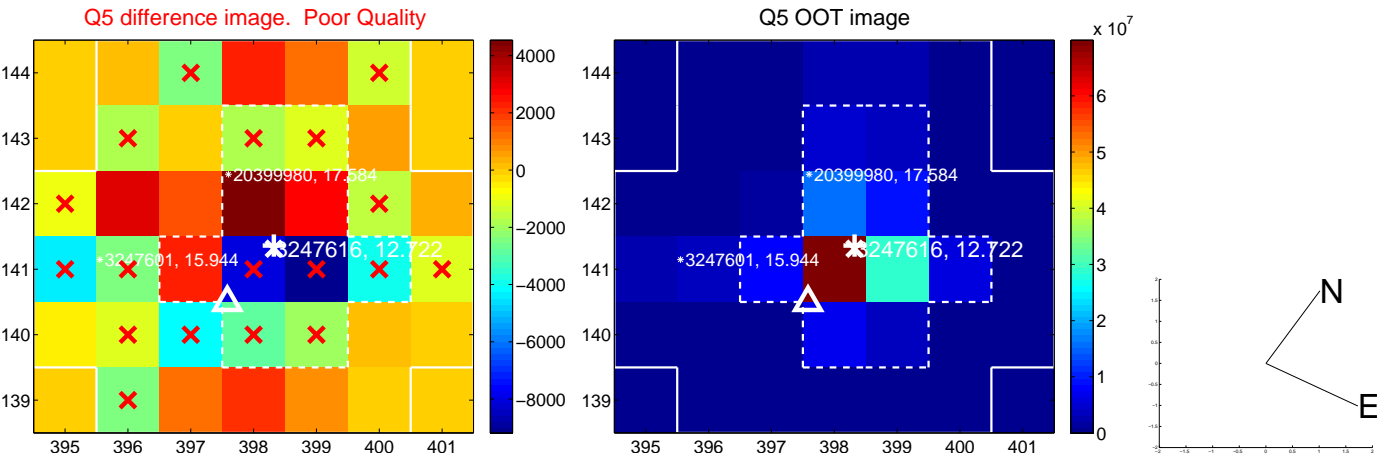
Q4 no difference image



Q4 no OOT image



white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

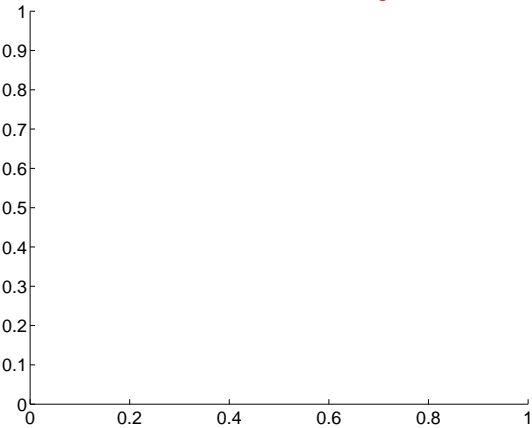
Q9 no difference image



Q9 no OOT image



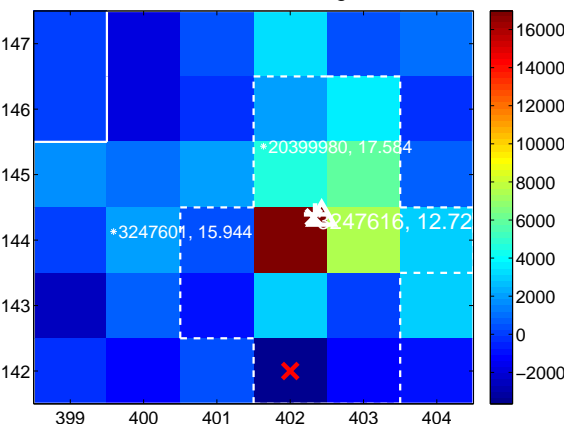
Q10 no difference image



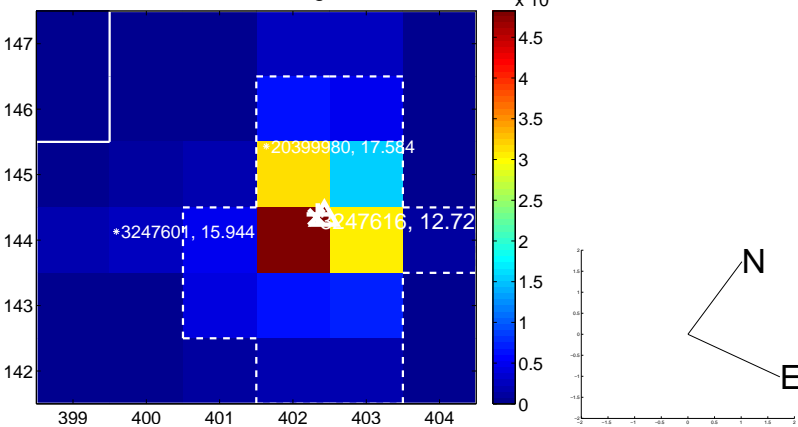
Q10 no OOT image



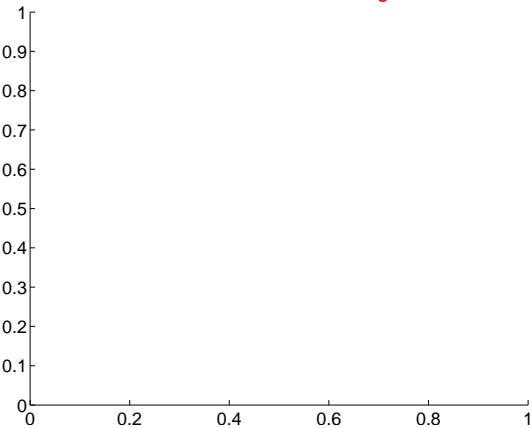
Q11 difference image



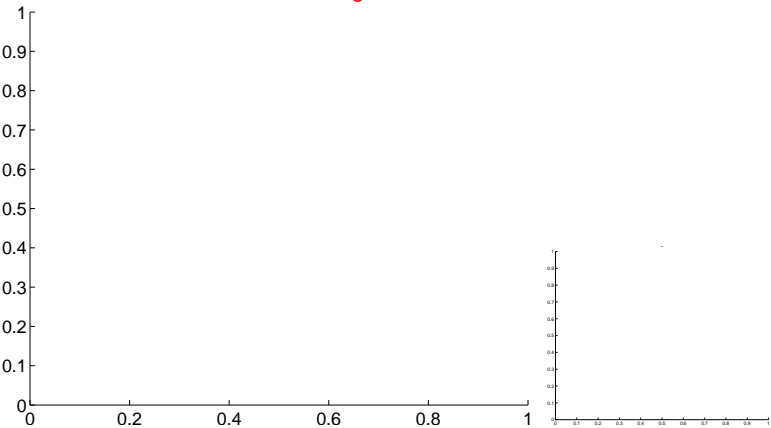
Q11 OOT image



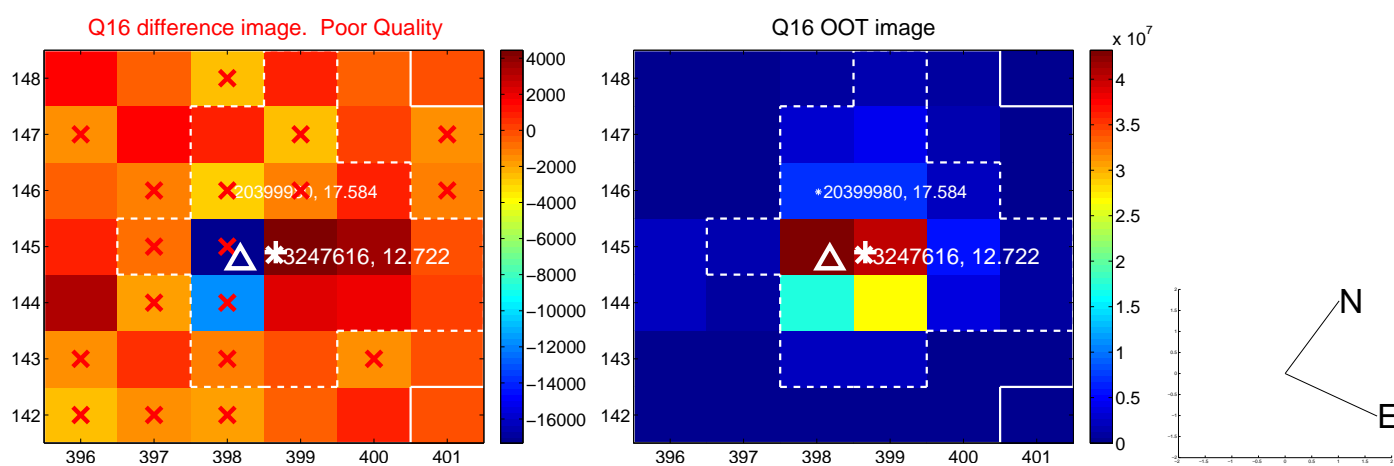
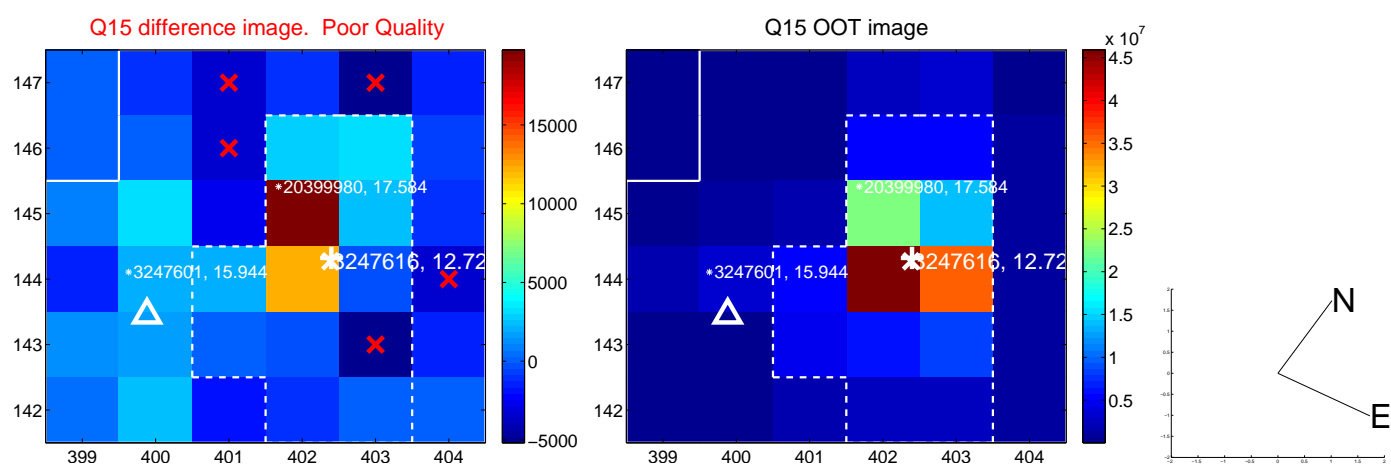
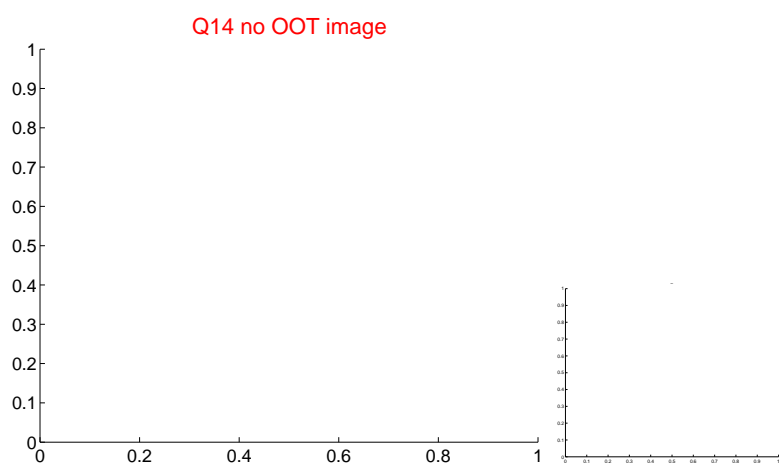
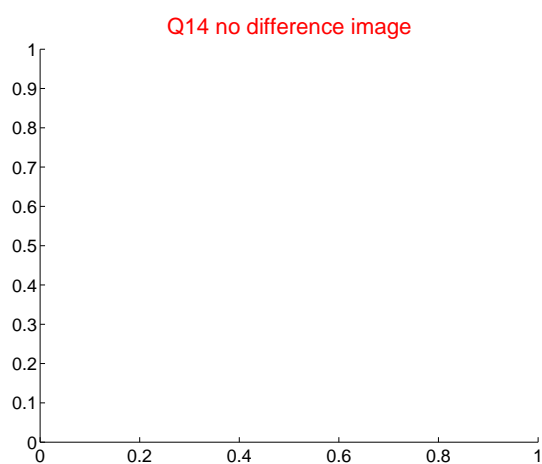
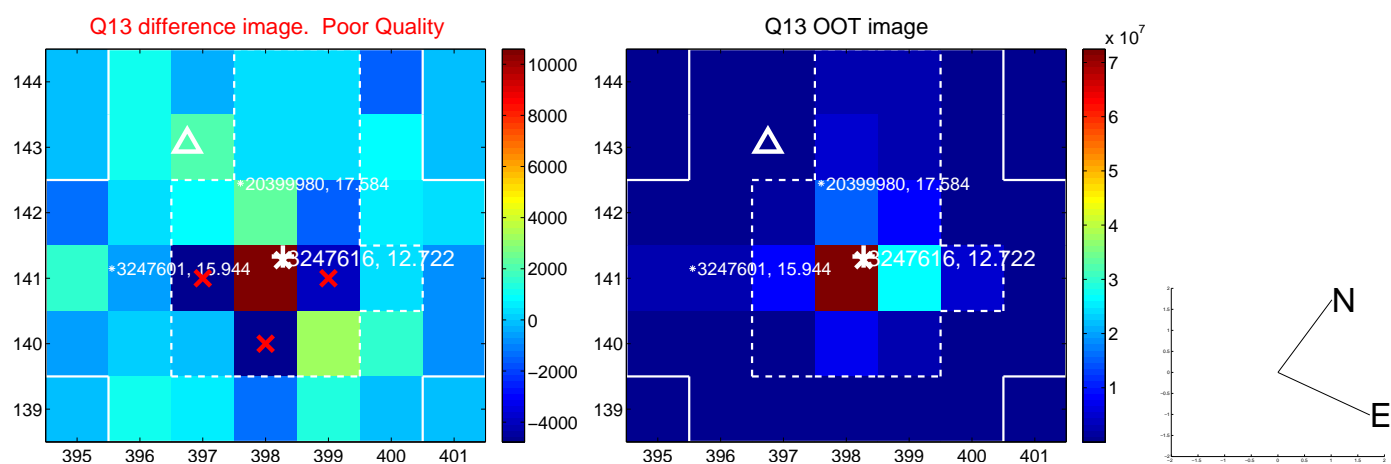
Q12 no difference image



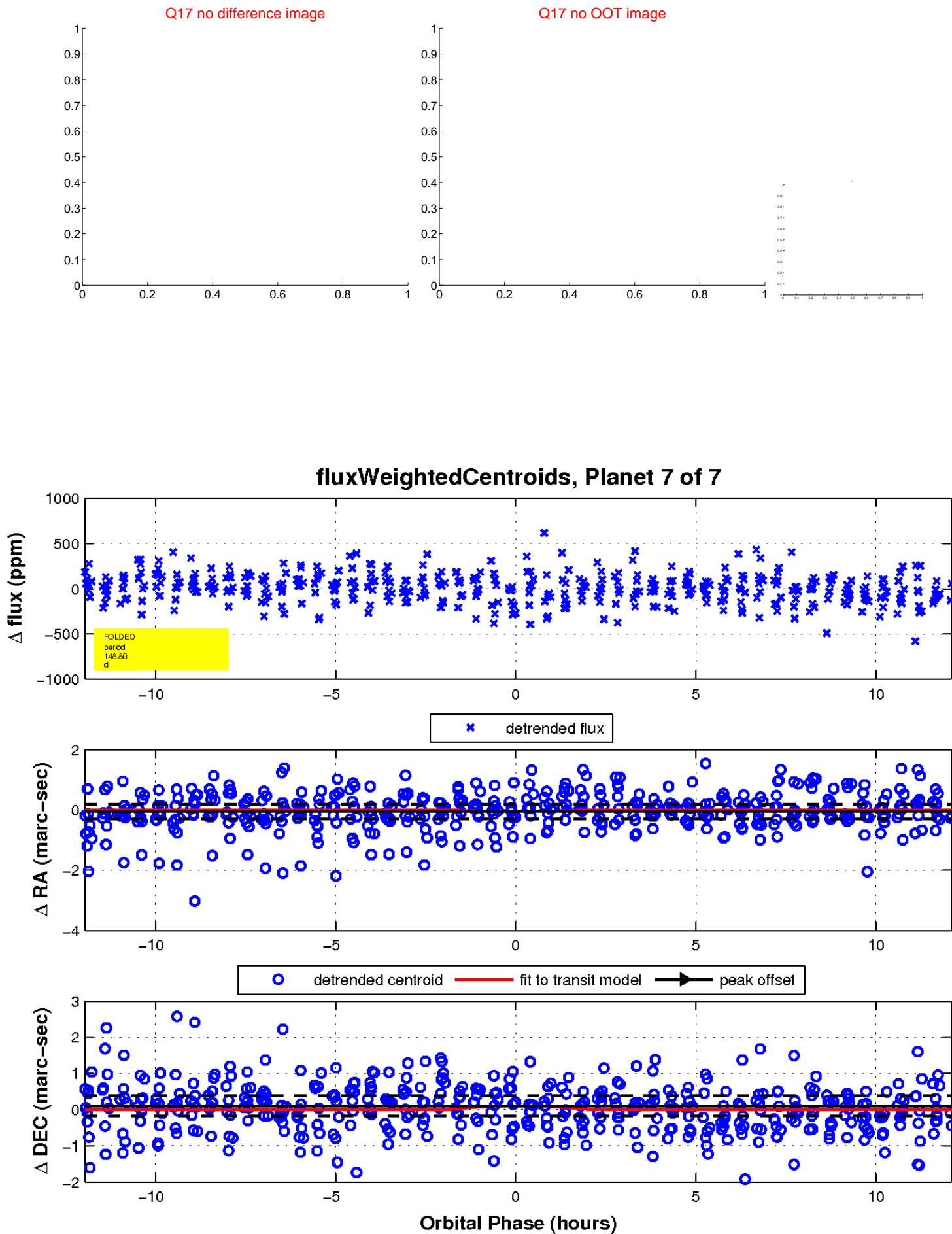
Q12 no OOT image



white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination

